

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] Symposium · PRESIDENTIAL SESSION: WHAT IS AT STAKE? THE IMPACTS OF INEQUITY AND HARASSMENT ON THE PRACTICE OF ARCHAEOLOGY

(PRESIDENTIAL SPONSORED SESSION)

Research and reporting on equity and harassment in the academy and across various fields in both public and private sectors reveals the extent of chronic inequalities and significant problematic behaviors in various workplace settings. Groups most negatively affected by these inequities and often illegal behaviors are women, the LGBTQ+ community, and underrepresented racial and ethnic groups. For archaeologists, workplace settings include many locales (offices, labs, classrooms, field sites, conferences) and thus many potential sites for inequity, harassment, and assault to occur. To be clear, this is broad disciplinary issue affecting the very performance of archaeology. In addressing this looming and serious problem, this session brings together a wide range of practicing students and professionals to consider: (1) equity (e.g., gender pay gap, publication/citation practices) and (2) sexual harassment and assault (e.g., as experienced and perpetrated by different subgroups, effects on professional outcomes, effective training/reporting, resources for survivors). Wherever possible, presenters discuss recommendations at several scales (e.g., individuals, workplaces, field settings, and conferences). We hope that highlighting these issues at the forefront of our annual meeting will make evident that inequity and harassment affects all practitioners and open a dialogue on these issues that continues throughout and beyond the conference itself.

[2] Symposium · THE PRECOLUMBIAN DOTTED-DIAMOND-GRID PATTERN: REFERENCES AND TECHNIQUES

Even degraded samples, ceramic impressions, and images of precolumbian textiles may illustrate patterning. The regularity of certain designs suggests that these were specific, named patterns that were shared and meaningful; their appearance on specific garments suggests that they had links to gender, affiliation, and/or status. One familiar pattern found throughout the Americas is a crosshatched lattice with simple motifs at the center of each interstitial space. Sometimes called the "dotted diamond grid," the pattern has been interpreted variously as depicting plots of agricultural land, scutes on a tortoise shell, blossoms in a field, or the dented kernels on a ripe ear of corn. Possible variations of this pattern may include squares, zigzags, V shapes, or triangles. Technical proposals for the manufacture of these designs include weaving, beading, painting, batik, tie-dyeing, and felting with patterned bark beaters. This session considers the "dotted-diamond-grid" pattern, its manufacture, and its meaning among different indigenous American cultures, with the goal of pulling together a fuller, more thorough understanding of the design and to expand recognition of its variations.

[3] General Session · HISTORIC ARCHAEOLOGY IN THE SOUTHEAST UNITED STATES

[4] General Session · ARCHAEOLOGY OF LOWLAND SOUTH AMERICA

[5] Poster Session · COMPOSITIONAL ANALYSIS AND MATERIALS SOURCING

[6] Poster Session · LITHIC STUDIES IN NORTH AMERICA

[7] Poster Session · DIGITAL ARCHAEOLOGY IN MESOAMERICA

[8] Poster Session · GEOARCHAEOLOGY

[9] Poster Session · BEYOND TRIAGE: PRIORITIZING RESPONSES TO CLIMATE CHANGE IMPACTS ON ARCHAEOLOGICAL RESOURCES

(SPONSORED BY COMMITTEE ON CLIMATE CHANGE STRATEGIES FOR ARCHAEOLOGICAL RESOURCES)

Environmental impacts associated with climate change threaten archaeological resources—documented and undocumented—in all types of settings. Accelerated loss is documented for coastal and interior regions around the world so that archaeologists and preservation planners are now in a position of making difficult decisions about the types of resources and settings that should be prioritized for study. Ideally, this work should be proactive and collaborative, involving a range of stakeholders who can make informed decisions that encompass not only known resources but areas with the potential to yield new information. This session addresses approaches to prioritization in the face of limited funding and time.

[10] Symposium · THE PALACE OF XALLA AT TEOTIHUACAN

The Xalla palace is located 235 m to the north of the Pyramid of the Sun. Since 1997, I have directed the "Teotihuacan: Elite and Rulership: Excavations at Xalla and Teopancazco Project." This multifunctional palace may have been one of the seats of power for ancient Teotihuacan: it has an unusually large size in the context of the city, with a surface of approximately 55,000 m². Also, it is not

located along the Street of the Dead, but 235 m east from this avenue, providing a sense of privacy; it is isolated by a double wall about 3 m wide that would have allowed watchmen to walk around it. This symposium will deal with the first results of the extensive excavations by Linda R. Manzanilla from 2000 to 2020; the possible functional sectors; the results of different analyses: archaeomagnetic and radiocarbon dating; lapidary objects, pigments, mica, marine shells, faunal remains, figurines, and ancient DNA.

[11] Symposium · FROM VELD TO COAST: DIVERSE LANDSCAPE USE BY HUNTER-GATHERERS IN SOUTHERN AFRICA FROM THE LATE PLEISTOCENE TO THE HOLOCENE

Coastal-focused narratives have dominated our understanding of the behavioral diversity seen in the Late Pleistocene and Holocene archaeological records of southern African during the past 20 years. However, these narratives tend to overlook the persistent presence of hunter-gatherers in diverse landscapes in the interior regions of the continent. Recent fieldwork and research demonstrates the presence of hunter-gatherers in montane, desert, semi-desert, grassland, and riverine environments from at least the Late Pleistocene onward. This session will therefore bring together researchers working across the distinctive environments found within southern Africa to contribute toward a more cohesive understanding of hunter-gatherer landscape use in this region during the past 100,000 years. In this respect, rather than focusing on one biome as a source of innovation, this session will emphasize the presence of hunter-gatherers across southern Africa's diverse environments, and the connections and interactions across these landscapes, as a means to better approach an understanding of the past in this region.

[12] Symposium · HEARTH AND HOME IN THE INDIGENOUS NORTHEAST

As ground-zero of domestic life, the house plays a central role in structuring, reproducing, and remaking society; it is both a mirror of social life and an agent for changing it. As such, an archaeological reckoning with household design, use, variability, and change over time is critical for a holistic understanding of the past. Papers in this symposium document domestic architecture and use, and variability in both in time and space as a springboard for understanding the indigenous history of the broader Northeast.

[13] Symposium · BIG IDEAS IN NEW ENGLAND ARCHAEOLOGY: CELEBRATING THE LEGACY OF BRIAN D. JONES

In this session we celebrate the impact that Brian Jones had on New England archaeology, and we explore how some of his self-proclaimed "crazy ideas" can be carried forward in the future. Brian brought a tremendous amount of energy, enthusiasm, creativity, joy, and commitment to his work. Brian received his PhD in anthropology at UConn in 1998. His professional appointments included the Mashantucket Pequot Museum, the University of Connecticut, the Public Archaeology Survey Team, and the University of Massachusetts Amherst. He was the Connecticut State Archaeologist from 2014 until his passing in 2019, and he was affiliated with the Connecticut State Museum of Natural History at UConn. His interests and insights spanned the globe, with a special focus on the peopling of the New World, lithic analysis, and geoarchaeology. His specific contributions to New England archaeology focused on the Paleo-Indian and Archaic periods, and the seventeenth century. Brian was passionately committed to public archaeology, education, and mentoring of the next generation of archaeologists.

[14] Symposium · ARCHAEOLOGY AND THE HISTORY OF HUMAN-ENVIRONMENT INTERACTION IN THE LOWER BELIZE RIVER WATERSHED

This organized session presents archaeological investigations in the lower half of the Belize River Watershed. The Belize River East Archaeology (BREA) project was initiated in 2011 and comprises a study area between Belmopan and Belize City that measures roughly 6,000 km². In less than a decade, the BREA team has documented over 100 ancient Maya settlements as well as numerous colonial period archaeological sites within the Belize River Watershed, most previously unrecorded. An overall goal of this interdisciplinary research has been to document changing human-environment interaction through time, specifically examining wetland use in this low-lying coastal zone. As home to the largest inland wetland in the country, this part of Belize is biologically diverse and provides a rich repository of sediments, fauna, and plant remains that offer important proxies for gauging climate change, such as drought, and for understanding the history of human-environment interaction through time. Perhaps not coincidentally, the area shows evidence of thousands of years of continuous occupation, beginning in preceramic times and continuing with ancient Maya and colonial period occupation. This session offers a comprehensive review of these finds.

[15] Symposium · LIFE IS RISKY: HUMAN BEHAVIORAL ECOLOGICAL APPROACHES TO VARIABLE OUTCOMES

Every human decision involves an aspect of risk. As such, it is critically important that anthropologists develop a general framework for defining and explaining risk-sensitive behavior. Human behavioral ecology (HBE) has long been interested in understanding the conditions under which individuals should be risk-averse, risk-prone, or risk-indifferent. HBE formally defines risk as probabilistic variance and seeks to explain risk using an explicit cost/benefit framework. As anthropologists and archaeologists continue to incorporate risk into our understanding of human behavior, we believe it is time to present a synthesis of recent HBE research that explores how humans confront variable outcomes. This organized session will highlight current archaeological investigations into risk. Our goal is to provide an explicit—and hopefully consistent—HBE framework for understanding risk and to discuss the ways in which risk-sensitive research has changed over the last several decades.

**[16] Symposium · THE ROCK ART OF TEXAS
(SPONSORED BY ROCK ART INTEREST GROUP)**

This symposium examines the rock art of hunter-gatherers and farmers, with a geographic focus on Texas and adjacent areas. The region is home to a diverse assemblage of visual expression consisting of pictographs, petroglyphs, and mobiliary art spanning at least 7,000 years. The symposium will cover a broad range of topics, including recording protocols and techniques, theory, interpretation, preservation, education, and the application of rock art data to broader research domains such as mobility, social organization, ritual expression, and human agency.

[17] Symposium · GEOMETRIC MORPHOMETRICS IN ARCHAEOLOGY

Geometric morphometrics is the quantitative analysis of shape, form, allometry, and asymmetry. The methods of geometric morphometrics enlist shape outlines or specific landmarks, returning multivariate data for statistical analyses, and a rich suite of visualization tools. Given that a primary goal of archaeology is to observe and study variation in the material record of the past, geometric morphometric methods hold remarkable potential for accomplishing this in an objective and reproducible manner while retaining much of the complexity inherent in the object's shape. The number of archaeological studies that enlist a geometric morphometric approach remains relatively small but is growing rapidly as a testament to the utility of the approach. New software and analytical packages, which include add-ons and updates to existing software, have increased the accessibility of geometric morphometric methods. Coupled with the increased availability of 3D technology, geometric morphometrics promises to be an important and widely used tool for answering sophisticated and elegant questions related to artifact shape. This session aggregates researchers from a variety of geographies and archaeological domains to address theoretical concepts, novel methods, and procedures, and also includes a series of case studies.

[18] Symposium · 20,000 YEARS UNDER THE GULF: EXPLORING RECENT RESEARCH IN THE GULF OF MEXICO FROM SUBMERGED PALEOLANDSCAPES TO HISTORIC SHIPWRECKS

As the ninth-largest water body in the world, the Gulf of Mexico has played an important role in human history from migration and colonization to resource extraction, trade, and warfare. Recent marine archaeological research here focuses on a wide array of topics spanning the Paleoindian and Archaic periods through World War II. Groundbreaking discoveries, incorporation of innovative technologies, and development of interdisciplinary studies demonstrate that research in the Gulf of Mexico is driving the field of marine archaeology forward in the twenty-first century. In addition to presenting new, ongoing, and recently completed work, the session will explore the interconnectivity between how natural processes shape, modify, and impact submerged archaeological sites and how the presence of archaeological materials can, in turn, influence the marine environment itself. Here, we examine how 20,000 years of sea-level change, demographic shifts, and colonization have shaped the "Aqua Terra," or seafloor surface, of the Gulf of Mexico.

[19] Symposium · HALL'S CAVE, TEXAS: GEOARCHAEOLOGY, ARCHAEOLOGY, GEOCHRONOLOGY, AND PALEOECOLOGY

(SPONSORED BY CENTER FOR THE STUDY OF THE FIRST AMERICANS, TEXAS A&M UNIVERSITY)

Hall's Cave, located in central Texas on the western margin of the Edwards Plateau, contains a remarkable geological record extending back to the late Pleistocene. While initial studies in the 1960s–1990s focused primarily on the paleontology of the Pleistocene/Holocene transition, more recent investigations between 2015 and 2019 have revealed a stratigraphic and paleoenvironmental record extending to 20,000 cal yr BP and an archaeological record indicating regular human occupation since 10,500 cal yr BP. Current investigations at Hall's Cave have brought together a wide spectrum of interdisciplinary research including archaeology, geochronology, paleontology, aDNA, paleoethnobotany, and more to provide a comprehensive environmental and human record for central Texas.

[20] Symposium · LIFE IN THE MIDST OF THE QUARRIES: NEW PERSPECTIVES ON QUARRYING AND STONEMWORKING IN THE PREHISPANIC MAYA LOWLANDS

Judging from the many stone buildings and monuments erected throughout most of the Yucatán peninsula and adjacent regions, stone extraction and production played a significant role in the daily life of the ancient Maya. De facto, stone quarries are one of the most prevalent features identified between, around, and even beneath these buildings and monuments. Yet, despite their ubiquity and the importance of stone resources in Maya society, these quarries have received little attention from archaeologists and the study of the activities undertaken in their limits or surroundings has been largely overlooked. By bringing together researchers that, in recent years, have investigated the primary evidence for quarrying and stoneworking activities in the prehispanic Maya lowlands, this session aims to discuss state-of-the-art and in-progress research, and to stimulate critical insights into this topic. Drawing from case studies that are both spatially and temporally diverse, the papers in this session illustrate the many ways in which Maya quarries can be approached and used as a key indicator for addressing issues on past technology and knowledge, land-use strategies, labor organization, and other social and economical aspects.

[21] Symposium · DEVELOPMENTS THROUGH TIME ON THE SOUTH COAST OF PERU

The desert region of the south coast of Peru has a rich archaeological past through which important developments of Peruvian prehistory and broader anthropological themes can be studied. Research from Cañete, Chincha, Ica, and Nasca is included in this symposium, spanning from the Early Horizon to the Late Intermediate Period. Early Horizon themes include the organization and function of Tajahuana within a regional context and economic specialization among Topará fishermen at Jahuay. Early Intermediate Period topics include models of exchange during the Paracas-Nasca transition, the manufacture and circulation of Nasca polychrome ceramics, social relations within a civic-ceremonial center in Ica, and spatial and social configuration of communities within an urban settlement in Cañete. The Middle Horizon is addressed through research on symbolic behavior in Nasca household archaeology as well as new findings on Wari colonialism in Nasca. Subjects from the Late Horizon and Late Intermediate Period comprise Chincha ceramics, the relationship between Inca administration and local Cañete practices, and the interaction of Chincha elites with the Inca state. The presenters cover a variety of themes and theoretical perspectives, reflecting the diversity of the archaeology in this area, but are united in their contributions to unfolding the South Coast past.

[22] Symposium · ANIMAL BONES TO HUMAN BEHAVIOR
(SPONSORED BY ZOOARCHAEOLOGY INTEREST GROUP)

The goal of the session is to reinforce the value of zooarchaeology to problems and questions in archaeology. Faunal remains from archaeological sites are the result of, and largely reflect, human behavior. As such, the papers in this session will use faunal data from various geographic regions and time periods, to explore, understand, and explain human behavior, activity, and decision-making. The papers will provide links between faunal data, human activity and accumulated deposits to explore the range of human adaptation.

[23] Symposium · RECONSIDERING THE ARCHAIC PERIOD IN THE AMERICAS

Since Willey and Phillips defined the Archaic period—as a stage of reduced mobility and intensified resource procurement—it was included in the culture-historical building blocks of sequences across the Americas. The Archaic lead-up to Formative-period sedentary, ceramic-using villagers who laid the stage for “Classic” civilizations. This evolutionary terminology persistently made it into chronologies, even where agriculture was never adopted. This session emerged from conversations between the organizers who work in Newfoundland/Labrador and Mesoamerica. The former region's Archaic period lasted for 4,000 years, followed by a non-agricultural, non-ceramic stage. In the latter region, it lasted for 7,000 years as a relatively stable adaptation of mixed forager-horticulturalists who then co-existed with ceramic-using villagers for over a millennium. We do not simply criticize existing definitions of what is “Archaic;” instead, we approach the mid-Holocene pattern of reduced mobility and changing resource procurement as worthwhile of comparative study on a hemisphere-wide scale. Rather than discarding the term Archaic, we investigate what value can be found to maintaining it. What defines their beginnings and how do we assess their endings? Are they static or dynamic periods culturally and/or ecologically? Is there anything we can refer to as “Archaic” that transcends regional culture histories?

[24] Symposium · STRATIFICATION AND CORRELATION: TOOLS AND TECHNIQUES FOR ARCHAEOLOGICAL CHRONOLOGY

Stratification and correlation are universally central to constructing site-specific and regional chronologies, yet archaeological practices vary from one part of the world to another. This session brings together scholars working in the Old and New Worlds to discuss the historical development, current state, and future goal of archaeological practice in the excavation, recording, and analysis of stratification at sites, as well as the correlation of strata within and between sites. Potential session topics include: sequence diagrams, including the Harris Matrix; space-time modeling of stratigraphic data; excavation strategies, including single context excavation; chronological modeling for age estimation, including hierarchical Bayesian models; seriation in a variety of archaeological settings; regional practices of correlation; and best practices for replicable and collaborative analyses, including sustainable strategies for large and complex stratigraphic and chronometric data.

[25] Symposium · ARCHAEOACOUSTICS: SOUND, HEARING, AND EXPERIENCE IN ARCHAEOLOGY

Sound has always been an omnipresent component of human experience, and recent trends in archaeological inquiry seek to explore the importance of acoustics, instruments, and what was heard in the past. More than a mere channel of communication, sounds, performances, and music conferred connotations of power, contributed to the formation of identities, and were an important part of all activities, including recreation, aesthetics, and ritual praxis.

This session presents case studies in applied archaeoacoustics, psychoacoustics, soundscapes, and archaeomusicology from a variety of scales and cultural perspectives. Defined by Scullin and Boyd (2014:363) soundscapes consist of “all sounds present in any given environment and how these sounds interact within that environment.” Here we consider a variety of archaeoacoustical topics, including: discussions of natural and anthropogenic places which affect the propagation of sound waves; the sonorous landscape; speech intelligibility; theoretical, psychological, and cognitive sonic studies; the conservation and promotion of auditory heritage; and studies of instruments used to produce music and/or signals.

[26] Symposium · BEYOND SETTLEMENT SCALING: COMPLEX SYSTEMS IN ARCHAEOLOGY

The recent discovery of allometric scaling relations in both urban and non-urban contexts that parallel those observed in contemporary urban systems is stimulating a range of approaches that emphasize central concepts in complex systems, including networks, self-similarity, information and energy, growth and emergence. Such discoveries are encouraging researchers to think in new ways about the archaeological record and stimulating new analytical approaches to a number of classic problems. They are also revealing new avenues for exploring the contemporary relevance of archaeology. The papers in this session bring together examples of this work from across the world in the hope of stimulating further development of complex systems approaches in archaeology.

[27] Symposium · CELEBRATING 20 YEARS OF SUPPORT: CURRENT WORK BY THE RECIPIENTS OF THE DIENJE KENYON MEMORIAL FELLOWSHIP FOR ZOOARCHAEOLOGISTS
(SPONSORED BY FUNDRAISING COMMITTEE)

For 20 years, the Dienje Kenyon Memorial Fellowship has been awarded to women early in their graduate education with a focus on zooarchaeology. It is competitive, international in scope, and unbounded by time or cultural focus. The fellowship is unique in that it is the only SAA award specifically supporting women researchers, the only award for students early in their graduate study, and one of the few awards available anywhere that aims at developing an archaeological subdiscipline. While such an award may be considered risky, Dienje knew full well the hurdles faced by women at this stage of their career, and was set on providing support. The fellowship has been given to scholars from around the world conducting research on diverse topics and cultures through the lens of zooarchaeological analysis. In testament to their hard work, most of the 19 award recipients have continued in archaeology and many have completed PhDs and embarked on successful careers as zooarchaeologists. This symposium is organized specifically to highlight the success and current research of award recipients over the last 20 years.

[28] Symposium · THE CURRENT STATE OF ARCHAEOLOGICAL RESEARCH ACROSS SOUTHEAST ASIA*(SPONSORED BY SOUTHEAST ASIAN ARCHAEOLOGY INTEREST GROUP)*

From Myanmar to Vietnam, Southeast Asia encompasses a deep history with a wide set of cultures. Over the last few decades, archaeological research in this area has experienced significant advancements in terms of theoretical approaches, methodological developments, and archaeological discoveries. New and continuing scholars and field projects have been substantially contributing to an evolving archaeological dataset. In an endeavor to present the rapidly changing state of archaeological discourse, a collection of scholars will discuss the progression and findings of research within their areas of interest. In this fashion, a diversity of topics will be presented from recent archaeological fieldwork throughout Southeast Asia. This will also assist in a continued effort to encourage a flourishing community of developing and established scholars.

[29] Symposium · PEOPLE AND SPACE: DEFINING COMMUNITIES AND NEIGHBORHOODS WITH SOCIAL NETWORK ANALYSIS

Archaeological applications of Social Network Analysis (SNA) inherently have a strong spatial component. Material culture exists in space, and the identification and distribution of these materials facilitates the creation of spatially located networks. Archaeology can contribute to the broader field of SNA through the creation and application of spatial SNA methods. Conversely, SNA may also be a powerful tool in the identification or reconstruction of neighborhoods and communities in the past through its ability to identify linked groups. This intersection means that SNA can provide powerful techniques to help archaeologists determine the presence and extent of different communities, as well as assess interactions within and among those communities. SNA can draw on artifact exchange systems, methods of production, or documentary sources to identify links between different nodes in networks of interaction. These data can then be used to reconstruct social networks. This session presents several papers from multiple regions focused around the application of SNA to identify discrete communities or neighborhoods. Interest in SNA as a tool to interpret archaeological evidence has been increasing dramatically, as has interest in identifying communities and neighborhoods. This application of SNA research is an open avenue of applicable research with potential utilization beyond archaeology.

[30] Symposium · CASE STUDIES IN TOOLSTONE PROVENANCE: RELIABLE ASCRIPTION FROM THE GROUND UP

As instruments suitable for the geochemical characterization of lithic raw materials have proliferated, so too has the application of these methods to a larger number of types of stone. While the wider availability of these instruments holds promise for lithic characterization, this opportunity is not without hazards. As lithic sourcing studies move beyond the characterization of (relatively) geochemically homogeneous materials such as obsidian, to include materials with more complex lithologies including coarse grained volcanic materials and silicious sedimentary rocks such as chert, a "one size fits all" approach will produce spurious results. This is not to suggest that the characterization of such materials is intractable but rather that archaeologists must approach each material with methods and strategies appropriate to the geologic history of the material(s) being studied. This approach often requires close cooperation with geologists and geochemists. The presentations in the session highlight "geology first" approaches to lithic characterization through individual case studies demonstrating methods to successfully (or not) approach geologically complex raw materials.

[31] Forum · WOMEN IN SAA: ISSUES FOR THE NEW MAJORITY

SAA's Albuquerque meeting jolted us with hurdles faced by women. Neither SAA nor AAA require members to identify as men or women, so we estimate, from voluntary identifications and numbers visible at meetings, that women appear to be half the membership of SAA—the tipping point. Will women predominate in archaeology? Will the profession become a "pink ghetto" with wages and prestige falling? What issues concern women in SAA? More archaeology PhDs are earned by women, but women remain 20% of tenure-track academia. Spousal hires and childcare slowly move from women's domain. Fewer women appear to be submitting to journals; more are teaching in institutions without research support. Fewer women get funding for field projects; instead, women are funded for lab work. Women-owned small businesses are common in CRM. Some women challenge conventional models and regional and disciplinary boundaries: does this marginalize them? These are structural issues, sexual harassment being one among them. An "archaeologist" is no longer a man whose wife frees him from domestic responsibilities. We see couples pushing strollers through the meetings, both spouses presenting papers. What can SAA do to level the playing field and lessen stress felt by players?

[32] Forum · COLLABORATIVE VIRTUAL SURVEY IN THE ANDES: THE GEOSPATIAL PLATFORM FOR ANDEAN CULTURE, HISTORY, AND ARCHAEOLOGY

This forum will present preliminary results from the GeoPACHA project, the Geospatial Platform for Andean Culture, History and Archaeology, in a highly interactive format. GeoPACHA is a browser-based, edited geospatial platform for discovering and mapping archaeological sites in the Andean region of South America. It is designed to facilitate the identification of archaeological sites through "virtual survey" of satellite and aerial imagery and consists of a simple browser-based interface that enables users to visually scan imagery and plot the locations of archaeological sites to a central GIS database using point themes. Project members are completing team-based survey projects during the fall and winter of 2019 and this forum will serve as an opportunity for them to solicit explicit feedback from colleagues about preliminary conclusions. Discussions will also consider the ethics and politics of virtual survey and the reframing of "communities" and "publics" in the context of continental-scale archaeological work.

[33] Symposium · COMPARING AQUATIC AND TERRESTRIAL TRANSPORT SYSTEMS IN ANCIENT CIVILIZATIONS

Moving goods over land requires the constant input of metabolic energy from humans or animals. Waterborne transport is very different. Although transportation over water is not without cost, horizontal friction is reduced by many magnitudes—substantially more than human- or animal-portering or even wheel-based terrestrial transportation. Aquatic surfaces are often enhanced by free-flowing energy in the form of wind, currents, or downhill flows; and buoyancy obviates the weight of waterborne vessels, allowing

large quantities of goods to be moved at little cost. Archaeologists in different parts of the world have long been aware of the importance of aquatic and terrestrial transport systems. For instance, in the Inca case, we find an imperial polity operating with virtually no navigable rivers and limited opportunities for aquatic transport. Whereas in ancient Egypt, a riverine transport system runs north-to-south, and terrestrial networks are necessary to move goods from east and the west. In other regions, like Amazonia or the Mediterranean, rivers or sea-networks promote transport links in virtually all directions. There remains little comparative analysis on how ancient polities have relied to variable degrees on aquatic and terrestrial transport systems. Papers are invited to examine this issue and begin developing a global, comparative framework.

[34] Poster Session · MESOLITHIC, NEOLITHIC, CHALCOLITHIC

[35] Poster Session · BRONZE AGE AND IRON AGE ARCHAEOLOGY

[36] Poster Session · PALEOLITHIC ARCHAEOLOGY

[37] Poster Session · ARCHAEOLOGY AT WAY RANCH: A DIVERSITY-SERVING FIELD SCHOOL

Accessible field schools are paramount for training a diverse group of future archaeologists. The Way Ranch field school, associated with the University of Texas at Arlington, was awarded a Field School Diversity Award by the Society for Historical Archaeology in 2018. Way Ranch is a multicomponent archaeological site in central Texas. Historic occupations represent some of the earliest European settlement in the region and are characterized by distinctive whiteware pottery, clay pipes, and metal tools. Way Ranch has both a rockshelter and open-air components. For the last three years, field school research has focused on the extensive middle and late Archaic occupations and associated lithic material. Posters present aspects of method and theory; presenting what has been learned about the site, its prehistoric inhabitants, and its implications for other times and places. Each poster is co-authored by one of the field school teaching assistants and two undergraduate field school students. Teaching assistants at Way Ranch represent both academic archaeology and cultural resource management—exposing students to a wide variety of career options.

[38] Poster Session · HUMAN ORIGINS MIGRATION AND EVOLUTION RESEARCH CONSORTIUM

The Human Origins Migration and Evolution Research (HOMER) Project is a collaborative effort that seeks to understand the emergence of human uniqueness. The last 100,000 years have witnessed the extinction of many species in the genus *Homo*, while *Homo sapiens* have undergone an unprecedented and successful global expansion. The biological, social, cognitive, and environmental factors behind this event has been the focus of archaeological and paleoanthropological research. To understand the origins of these behaviors, the HOMER Project built a large-scale research model, one that can compare *Homo sapiens* and sister species through a multiproject, transcontinental research collaboration. All project members share a standardized field and lab methodology to generate a highly effective comparative analysis. HOMER uses data collected at archaeological sites in Italy, Malawi, and South Africa to examine the questions of when and how *Homo sapiens*' unique adaptations arose. In this symposium, HOMER students will present research conducted at these sites, involving archaeoinformatics, zooarchaeology, biological archaeology, and lithic analysis.

[39] General Session · INAA ANALYSES IN CENTRAL AND NORTH AMERICA

[40] Symposium · LATE PALEOINDIAN LIFEWAYS AND PALEOENVIRONMENT IN THE TEXAS BIG BEND

Since 2010, recurrent archaeological, geoarchaeological, and paleoenvironmental investigations have been conducted at the Genevieve Lykes Duncan Site (GLD), a deeply buried multicomponent site containing stratified Late Paleoindian deposits. Data obtained during these investigations indicate that the Late Paleoindian occupants of the GLD site adapted early on to xeric conditions similar to that of today's Chihuahuan Desert during the Early Holocene. This adaptation to dryer conditions at the GLD site is most apparent in the incipient development of earth oven technology and tentatively constitutes the oldest known use of earth ovens in North America. Results of other paleoenvironmental data indicate that the nearby riparian zone of Terlingua Creek was much more robust as compared to today and no doubt offered a diverse suite of plant and animal resources. This resultant mix of both xeric and mesic biotic resources, coupled with the high availability of distinct raw material types of source areas at and near the GLD site, accounts for the unique character of Late Paleoindian deposits there. The results of excavations and attendant analyses will be presented.

[41] Symposium · INDIGENOUS ARCHAEOLOGY, THE SEVENTH GENERATION

This symposium will highlight up and coming indigenous scholars work within the growing paradigm of indigenous archaeology. Though archaeologists have begun to adopt and include indigenous practices in the field of archaeology, only recently have indigenous people began to include their own cultural methods and practices as archaeologists. Growing on the foundational work of scholars such as Joe Watkins and Sonya Atalay, this symposium will be a discussion of the future directions of indigenous archaeology.

[42] Symposium · NEW INSIGHT INTO THE QIN TERRACOTTA ARMY AND EARLY IMPERIAL CHINA

Recent archaeological discoveries about both the Terracotta Army and Qin period China more generally are revolutionizing our view of this early phase of the empire. This session provides a fresh opportunity to combine material and written evidence for artistic developments, technological know-how, ritual practices, individual behavior and state-level organization, with a view to understanding how these all offer insight into early imperial China. We expect the communication fostered by this session also to facilitate new methodologies and theoretical frameworks with relevance to our understanding of the Terracotta Army and Qin Shi Huang mausoleum complex itself, to wider trends in Chinese archaeology, to the wider study of major changes across Eurasia in the first millennium BCE and to other archaeologists studying early complex societies.

[43] Forum · TRIUMPHS, CHALLENGES, AND POSSIBILITIES IN HERITAGE EDUCATION

(SPONSORED BY THE HERITAGE EDUCATION NETWORK (THEN))

One of The Heritage Education Network's core goals is "to provide a forum and network for practitioners, professional educators, and the public to communicate and collaborate about heritage education." Toward that end, this session offers an opportunity for panel members and the audience to share their recent successes and challenges in heritage education. We hope that all will leave the forum invigorated and inspired by our collective accomplishments, and just as importantly, with concrete solutions to the challenges we face as we enter a new decade.

[44] Forum · FOSTERING COLLABORATIVE PARTNERSHIPS WITH TRIBES: A DIFFERENT WAY OF THINKING

Since the landmark 1992 revisions to the National Historic Preservation Act, tribal representatives, academic archaeologists, cultural resource practitioners, and agency personnel have struggled with tribal consultation, the identification of tribal resources, and the participation of tribal cultural specialists in the site identification and evaluation process. Our panelists are all working at the leading edge of an effort to rethink past approaches and provide an outline moving forward by fostering collaborative partnerships between tribal practitioners and archaeologists. Each brings a unique perspective and experience to the practical applications of building America's renewable energy infrastructure. As the world's largest generator of renewable energy, NextEra Energy has found that the earlier they engage with Tribes to understand where sensitive resources are located, the easier and less costly it is to make the changes necessary to avoid these locations. Tribes have demonstrated on multiple projects that many sites of religious and cultural significance to the Tribes are not adequately identified or evaluated by professional archaeologists. All tribally identified resources are important cultural sites, and we are working to develop best-practices to identify and physically avoid these locations in project design and construction, where feasible.

[45] Symposium · ARCHAEOLOGICAL APPROACHES TO TECHNOLOGIES IN EAST ASIAN ARCHAEOLOGY

Technologies form an important foundation for social interactions, institutions, and practices. Broadly construed, technologies are those traditional, effective acts that create a system that ties together a variety of interrelated forces, affordances, practices, and beliefs. As such, we should consider all manner of practices through the lens of technology as a means to understand past social organization. This session considers a wide range of topics in the study of East Asian archaeology—from subsistence technology, through craft technology, to music, landscape, and other forms of technological practice—and through their juxtaposition makes an argument for a broad understanding of technology and its impact.

[46] Symposium · ARCHAEOLOGISTS SPEAK: OUR MOST CRITICAL INSIGHTS

Archaeology undoubtedly produces insights worth sharing—insights that can change how we think about the human past, present, and future. For a variety of reasons, however, our best ideas are often buried in academic journals, expensive edited volumes, and presentations at members-only conferences. Our most critical contributions are thus usually inaccessible to all but a few. What if we archaeologists presented our ideas differently? Could twenty-first-century methods of communication change not only how we communicate but why and with whom? In the past few years, short video presentations have emerged as a popular format for expressing singular and powerful ideas in a compelling, narrative style. These presentations are both informative and personal. They impart unique ideas, include transformational moments, and touch on universal themes. What if archaeologists mastered these kinds of presentations? What insights would we share? With these ideas in mind, this symposium asks each participant to present in an accessible, narrative style the single most powerful insight that has emerged from his or her experiences as an archaeologist. This is an invitation for experimentation as we explore a more forward-looking approach to sharing our critical insights about humanity, with humanity.

[47] Symposium · ART STYLE AS A COMMUNICATIVE TOOL IN ARCHAEOLOGICAL RESEARCH

Mesoamerican scholar Linda Schele often said for those who study ancient cultures, their primary focus should be reviving the voices of the people who created those cultures. In this symposium, we recognize that the many cultures of Native North America, which lacked formal writing systems but often have sophisticated identifiable art systems. Within these systems, elements of style functioned as a form of communication. As a diagnostic category of art, style is best understood as the formal qualities of a work of art that link it to other works of art. Over the last 40 years, several major Southeastern art styles such as Braden, Craig, and Holly Bluff have been identified through stylistic analysis. Within these papers, stylistic origins, groupings, and functions will illustrate the many systems of Native American styles that developed over time and across geography. When these artistic systems are grouped into their various stylistic components, they function to reanimate the voices of the past. Examining visual style with archaeological information can reveal, almost audibly, the ideological systems and cosmological beliefs of their ancient North Americans creators.

[48] Symposium · REGIONAL SETTLEMENT NETWORKS ANALYSIS: A GLOBAL COMPARISON

Settlement networks express the nature of human interactions across vast regions. Over the past 20,000 years, human settlement behavior has seen several nonlinear major transitions from mobile hunter-gatherer networks, to sedentary communities, to urban societies. Through the lens of a global comparison we aim to identify shared trajectories and global patterns, beyond chronological and spatial constraints by analyzing comparable traits such as site size, settlement density, settlement network size, and intensity. Regional models that range across those major transitions can be contextualized within a comparative framework thus aiming at bridging the gap between global and regional-local scales of interaction. Specific factors in the emergence of networks varied across space and time. Comparing different outcomes might inform us about the factors influencing the duration and continuities of those networks. Bringing together quantitative methods and new theoretical frameworks has the potential to shed new light on the nature of human settlement behavior in extensive regions, over long time spans.

[49] Symposium · WHOSE HISTORY IS IT ANYWAY? ARCHAEOLOGICAL COLLECTIONS AND THE PROBLEM OF INSTITUTIONAL CONTROL

Exclusive institutional control of archaeological materials and information derived from them is a dominant concern in any project involving collections associated with descendant communities. Activities conducted under the aegis of NAGPRA, in particular, illuminate how tribal nations often must rely overwhelmingly on one-sided institutional interpretations to determine what materials (remains, items, and associated documents) may be of interest. Although NAGPRA has many obvious benefits, case studies show that pertinent evidence—including field and lab records, maps, and similar documents—are sometimes selectively kept from (or even misrepresented to) indigenous communities. While arguably not all missing or misrepresented data are excluded or distorted deliberately, their absence or inaccuracy still can create false narratives and incorrect perceptions about the individuals and objects represented in NAGPRA collections. This session presents examples of both helpful collaborations and cautionary tales of interactions between institutions and tribal nations. Because it can be argued that much research involving American Indian collections is not ethical research if it is not collaborative, this session focuses on positive strategies for involving relevant communities in substantive ways that help both tribes and institutions navigate future NAGPRA and other archaeological projects.

[50] Symposium · SOCIAL ARCHAEOLOGY IN THE NORTH AND NORTH ATLANTIC (SANNA 3.0): INVESTIGATING THE SOCIAL LIVES OF NORTHERN THINGS

For 40 years, the archaeology of the North and North Atlantic has become increasingly productive. Interdisciplinary work grounded in environmental archaeology has crosscut local, national, and regional boundaries to produce significant advances in methodology, collaborative practice, and human-ecodynamic interpretations. However, studies of Northern material culture have been less transformative and often remain limited by regional, period-specific, or material-specific intellectual traditions that relegate objects to the category of "small finds" and to studies that focus primarily on functional, chronological, or typological analyses. SANNA is a project bringing together northern archaeologists interested in looking beyond the immediate or visible characteristics of material culture. SANNA 3.0 focuses on the creation, use, meaning, interpretation, discard, and/or reuse of "portable artifacts": items smaller than architecture or landscapes that not only create intimate bonds in domestic contexts but also link humans, animals, and nonhuman worlds in various ways and at diverse social scales. The presentations in this symposium not only look at how objects circulated, were used, and had social meaning in the past but also at how they gain new social lives when we, as archaeologists, and others—including descendant communities and the public—encounter them again and give them new meanings.

[51] Symposium · ETRUSCAN CENTRALIZATION TO MEDIEVAL MARGINALIZATION: SHIFTS IN SETTLEMENT AND MORTUARY TRADITIONS AT SAN GIULIANO, ITALY

We present the first four seasons of archaeological work at San Giuliano, a multicomponent site in Lazio, Italy. Our research focuses on the Etruscan (late eighth–third centuries BC) and high medieval (ca. AD 800–1250) periods, which saw the most intensive habitation of the San Giuliano plateau and the construction of cemeteries with distinct burial traditions. Data are drawn from (1) single-burial trench tombs transitional between the Villanovan and Etruscan periods; (2) looted Etruscan rock-cut tombs, which show significant promise for recovery of artifacts and human bone; (3) regional road systems; and (4) a medieval fortified castle site atop the plateau, including a hall and a mortuary structure adjacent to a possible chapel. These analyses elucidate both the rise and fall of the Etruscan urban center and the medieval process of *incastellamento*, or castle-building with relocation of populations to defensible hilltops, that reshaped the Italian landscape in the tenth–twelfth centuries. The multidisciplinary and international collaboration of the San Giuliano Archaeological Research Project (SGARP) reveals diachronic patterns in settlement and mortuary practice that have wider implications for north central Italy and the western Mediterranean more broadly.

**[52] Symposium · CULTURAL RESOURCE MANAGEMENT ACROSS THE DOD
(SPONSORED BY MILITARY ARCHAEOLOGICAL RESOURCES STEWARDSHIP)**

Across the Department of Defense, cultural resource management programs have been responsible for a variety of unique projects and management approaches. Exploring data management through GIS, consulting with Native American tribes in unique ways, and investigating historic and prehistoric sites are just a few examples of various Department of Defense projects. This symposium presents a summary of these various activities and more carried out in the management of our nation's cultural resources.

[53] Symposium · MAYA RITUAL IN ECONOMIC AND SOCIAL EXPRESSION: EVIDENCE FROM THE THREE RIVERS REGION

While ritual or religion may not determine ancient Maya economy, it does structure it (McAnany and Wells 2008). Much the same can be said about the role of ritual in society or social organization. Ritual quite likely structured much of daily life and social interactions. As such, ritual in both economic and social expressions was varied, multifaceted, chronologically sensitive, and complex. It differed both intra-regionally and inter-regionally as well as from urban to rural settings. Evidence from various sites

within the Three Rivers Region reflect a wide array of ritual as it necessarily structured both economic and social life among the ancient Maya at different times in diverse urban and rural contexts.

[54] Symposium · ANCIENT MAYA EMBEDDED ECONOMIES

Economies are embedded within the sociopolitical dynamics of society, thus providing a lens through which to study broader organizational frameworks. In this session, we examine the entanglement of economies with political, social, and religious practices to understand integration processes of the ancient Maya. The organization of ancient Maya economies has been a subject of much debate and discussion. Many early studies focused on the dichotomization of elite and non-elite economies and the ways in which economies legitimate hierarchies. Economic activities can function to create such divisions and it is important to understand how they do so. More recently, scholars have turned to question how economic networks crosscut socioeconomic and political boundaries, placing an emphasis on integration processes. Through utilizing both approaches, we can gain more nuanced understandings of interaction networks that in turn affect understandings of the broader organizational principles of the ancient Maya. Papers in this session utilize diverse datasets from multiple regions of the Maya world to provide a comparative perspective.

[55] Symposium · BAYESIAN ARCHAEOLOGY

(SPONSORED BY QUANTITATIVE METHODS AND STATISTICAL COMPUTING IN ARCHAEOLOGY INTEREST GROUP)

Archaeologists and other scientists typically use statistical techniques to evaluate how well empirical evidence supports their hypotheses. Historically, null hypothesis significance testing (NHST) has been a frequently used framework to achieve this goal. Today's NHST methods underlie popular statistical concepts such as confidence intervals and probability statements (p-values). NHST employs those statistical concepts to make probabilistic statements about one's data in relation to a hypothesis. Although this approach is very useful, the fundamental concepts in NHST can often seem arbitrary and confusing. Archaeologists and other scientists have begun to incorporate Bayesian methods into their analyses. Leveraging the weight of prior and new evidence, Bayesian inference empowers scientists to assign probabilities to competing hypotheses for comparison and enables their revision in light of new information (NHST does not). The Bayesian approach offers an alternative and, in some respects, improved statistical framework over NHST that is now practically approachable thanks to modern computing methods. This symposium aims to highlight the creative and diverse employment of Bayesian Inference by archaeologists, illuminate its structure, procedures, and accessibility, featuring the benefits of its implementation and replicability to archaeological research.

[56] Symposium · FEMALE FIRSTS: CELEBRATING ARCHAEOLOGY'S PIONEERING WOMEN ON THE 100TH ANNIVERSARY OF THE 19TH AMENDMENT

(SPONSORED BY HISTORY OF ARCHAEOLOGY INTEREST GROUP)

In recognition of the 100th anniversary of the ratification of the 19th Amendment, we celebrate other female firsts, specifically those of pioneering women in American archaeology and beyond. Although they gained the right to vote in 1920, women were not yet regularly allowed to participate on their own merit in American archaeology, with few exceptions. It wasn't until the mid-1920s that women were able to train beside men in graduate schools or field schools. During the 1930s, the numbers of women doing fieldwork and completing MAs greatly increased, and during the 1940s and 1950s, women had more access to earning PhDs. Despite these gains across the decades, women continued to experience lower pay grades, limitations on degrees obtained, and relegation to specific research niches. We focus on our predecessors who broke such barriers. These women, whether they were the first female PhDs in anthropology programs or female archaeologists of color, forged a path for others while also creating waves. Importantly, breaking barriers is not an artifact of the past; female archaeologists today, and certainly female archaeologists of color, continue to make strides in the field and achieve their own female firsts in the discipline.

[57] Symposium · THE ROLE OF STORYTELLING AND COMMUNITY DIALOGUE WITHIN LATIN AMERICAN ARCHAEOLOGY

Storytelling projects have the potential to transform the traditional relationship of the anthropologist as an expert into a collaborative endeavor focused on local community narratives. As such, they can be used as a tool for decolonizing the process of knowledge production, incorporating oral histories and ideas from participatory ethnography into the study of material heritage. In particular, projects that involve digital storytelling can explore how contemporary people view and engage with artifacts, sites, and landscapes. In this session, we consider how research projects apply diverse methodologies to work with local communities and incorporate their ideas about the cultural landscape. This session invites papers that focus on Latin America, an area of the world where archaeology, politics, colonialism, and heritage are particularly entangled and where relevant work on digital storytelling has begun relatively recently. The goal of the session is to share ideas among scholars working on storytelling and oral history projects in Latin America in order to inspire a deeper discussion of the relationship between archaeological practice and local communities. Here we address approaches to digital media, how to represent multiple tellings of a story, processes for crafting narratives, and the objectives we hope to meet through these projects.

[58] Symposium · EARLY CULTURAL RESOURCE MANAGEMENT FIRMS: VOICES FROM THE PAST AND PRESENT

Cultural resource management (CRM) is a field that, while begun principally as university-based programs in the 1970s, has its modern foundation in the 1970s and 1980s among founders of privately held firms. Through time, the number of private CRM firms has grown immensely, whereas the number of university-based CRM programs has declined. Early on, CRM firms focused almost strictly on archaeology, but today's CRM encompasses a much wider range of services for clients. This session has been organized to examine the origin of private CRM firms in the early days of the industry and to hear from the founders of those firms regarding how things have changed, or remained the same, over the past 40 years.

[59] Symposium · LOCAL MANIFESTATIONS OF CLIMATE CHANGE FOR ARCHAEOLOGICAL RESEARCH

In the most recent United Nations Intergovernmental Panel on Climate Change report, the working group on Impacts, Adaptation, and Vulnerability recognize that global climate change will have a wide range of localized variability that will require localized adaptation strategies. In order to determine the best response strategies to future change, policy makers have requested more data on local manifestations of climate change and localized adaptations. Given the hyperlocal nature of archaeology, our discipline is well-situated to collect data on how global climate change manifests at the local level. In addition to providing the much-needed data for policy makers, localized paleoenvironment datasets collected from the archaeological record exist at a scale more fitting to address anthropological questions related to human-environment interactions than our current global, or even regional, datasets of climate change. This symposium brings together new research across regions and specializations that utilize environmental proxies of climate change obtained from within an archaeological context to address how local signals differ or are similar to regional signals of climate change and how these local datasets can be used to answer questions of past human response and resilience to climate change.

[60] Symposium · ROCK ART: METHODOLOGY AND INTERPRETATION IN THE ARCHAEOLOGY OF THE SITE

(SPONSORED BY ROCK ART INTEREST GROUP)

The cultural manifestation we label rock art has the potential of being identified and recorded from wherever humanity has traveled. 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.

[61] Symposium · FOOD, DIET, AND CUISINE IN THE ANCIENT ANDES

(SPONSORED BY BIOARCHAEOLOGY INTEREST GROUP)

The Andean region, with its concentration of diverse physical environments and cultures, provides a unique locale to investigate the multiple dimensions of food and diet. Rather than a simple reflection of "eating local," dietary choices are also influenced by social differentiation, life course stages, gender, class, identity, and even cultural constructs about what constitutes "food," as can be seen in the diverse cultural traditions of the area. The generation of surplus, storage, and redistribution of food through feasting and exchange, control of food labor, and symbolic and sacred meanings of food play important political and religious roles as well. Therefore, the study of feeding and eating can illuminate a myriad of material and social issues, including power and inequality, taste, distinction, mobility, and the creation of social memory. The goal of this symposium is to explore the advances on food and diet's material and social dimensions among prehistoric Andean groups. Contributors to this theoretically diverse, multidisciplinary symposium employ a variety of direct and indirect methods to investigate the topic, including biogeochemistry, dental pathology, zooarchaeology, archaeobotany and analysis of activity patterns, ceramic vessels, and artistic representations, among others.

[62] Symposium · NEW DIRECTIONS IN MONGOLIAN ARCHAEOLOGY

Archaeology in Northeast Asia is undergoing great changes. Mongolia and proximate regions are an epicenter for new research approaches and syntheses of Northeast Asian and Eurasian archaeology. This session will highlight the work of a new researchers and the application of materials analysis, bioarchaeology, heritage management, isotope zooarchaeology, ceramic analysis, landscapes, excavation, and geoarchaeology to a range of problems covering Epipaleolithic to Medieval periods in the Northeast Asia steppe. We welcome papers on any aspects of ongoing and recent research in the region.

[63] Poster Session · ADVANCES IN WOODLAND ARCHAEOLOGY**[64] Poster Session · ARCTIC AND SUBARCTIC ARCHAEOLOGY****[65] Poster Session · ARCHAEOLOGY IN THE ROCKY MOUNTAINS****[66] Poster Session · PALEOINDIAN NORTH AMERICA****[67] Poster Session · PALEOINDIAN ARCHAEOLOGY IN CENTRAL AND SOUTH AMERICA****[68] Symposium · REGIONAL PERSPECTIVES ON FOLSOM SETTLEMENT, SUBSISTENCE, AND CHIPPED STONE VARIABILITY IN WESTERN NORTH AMERICA**

The archaeology of Folsom hunter-gatherers has enamored both archaeologists and artifact collectors since the discovery of the Folsom type site in New Mexico in the early twentieth century. Our perceptions of the patterns and processes that drive Folsom site distributions, subsistence regimes, and stone tool manufacture continue to be revisited with advancing theoretical and methodological perspectives. Increasingly, models concerning Folsom adaptive systems encourage the use of landscape-level interpretations with consideration of both cultural and environmental variables. Though substantial excavations of major Folsom sites have slowed in recent years, reanalysis of site collections with modern techniques and targeted sampling of select sites demonstrates that new insights can be gleaned through repetitive interaction with the Folsom archaeological record. This symposium brings together archaeologists from the High Plains, Southwest, and Rocky Mountain regions into a discussion of Folsom hunter-gatherers, with a focus on the variation in settlement strategies, hunting systems, campsite organization, and lithic technology.

[69] Symposium · ATLATLS AND RELATED WEAPONS IN THE SOUTHWEST AND BEYOND

Before the advent of bow-and-arrow technologies, atlatl-and-dart (spearthrower) technologies were in use by most ancestral populations worldwide. The best archaeological documentation of atlatls comes from the American Southwest, where dry-climate preservation allows us to see organic spearthrowers and complete projectiles, as well as stone and other points, and iconographic representations of use and symbology. The relationships of atlatl technology to other technological complexes, and changes in weapon systems and their possible social and economic implications are frequently considered here, but evidence from all over the world is relevant to understanding these concerns.

[70] Lightning Rounds · CLOSING THE FLOODGATES: POPULAR MEDIA AND CLIMATE CATASTROPHISM IN ARCHAEOLOGY

Archaeological research and discovery captivates the general public. Entire magazines, TV shows, and news articles are devoted to the topic, manifesting in "clickbait" derived from new archaeological discoveries such as "Did a mega-flood doom Ancient American City of Cahokia?" (National Geographic) or "Severe droughts explain the mysterious fall of the Maya" (BBC). These titles are fodder for curious minds and writers who use the past to create connections between ancient societies and us. Collapse narratives become the proverbial canary in the coal mine warning about the dangers of the changing climate, cited to either intensify or assuage the urgency of contemporary anthropogenic climate change. Often these articles focus on non-Western societies and their demise at the hands of the changing climate, which positions indigenous peoples as lacking agency, knowledge, and resilience. In this Lightning Round session, discussants address the ways popular media depicts archaeological research in the Americas and how the popular consumption of deterministic ideas about ancient human-environment relationships affects descendant communities, heritage management, and perspectives on contemporary climate change. Discussants also address how archaeologists can use popular media to advocate, emphasizing the agency of past peoples and the ways humans have persevered through climate change.

[71] Symposium · CABINETS OF CURIOSITIES: COLLECTIONS AND CONSERVATION IN ARCHAEOLOGICAL RESEARCH

Archaeological methods often entail destructive forms of data collection, such as excavation, to approach research questions. Existing collections may be used to answer the same inquiries, reducing the need for excavation and providing less destructive alternatives when designing research methodologies. Emphasizing the analysis of stored material culture presents invaluable aide in conserving archaeological sites and landscapes. This, in turn, lends to the reduction of artifacts recovered every year; an advantage growing in importance as storage space becomes increasingly thin. The papers discussed in this symposium highlight research projects relying on collections instead of excavation as the main source of data collection. Material types discussed range from ceramics of the seventeenth-century American Southwest and third-century Roman amphoras to a variety of faunal remains. The rise in conservation archaeologies employing non-excavation research designs present the opportunity for a more sustainable practice of archaeology. Museum-based archaeology thus provides as meaningful contribution to our discipline as excavation-based research. A methodology more inclusive of collections will not provide a solution to the storage problem but will aide in the growth of continued tenable efforts in conservation archaeologies.

[72] Symposium · DOCUMENTING DEMOGRAPHICS IN ARCHAEOLOGICAL PUBLICATIONS AND GRANTS

Since Joan Gero's (1985) pioneering article on "Sociopolitics and the Woman-at-Home Ideology," feminist archaeologists have been gathering data on the gendered dynamics of archaeological publication and funding. After a lull in the early 2000s, this literature has been undergoing a renaissance. Recent publications have shown that NSF-funded senior grants (Goldstein et al. 2018), and articles in *American Antiquity* (Rautman 2014) and *Journal of Field Archaeology* (Heath-Stout, forthcoming), are male dominated due to differential submission rates rather than bias in the review process. Others have demonstrated that there is a "peer review gap," where women are more likely to publish in non-refereed venues (Fulkerson and Tushingham 2019; Tushingham et al. 2017) or present at conferences (Bardolph 2018; Bardolph and Vanderwarker 2016) rather than publishing in peer-reviewed journals, including regional journals (Bardolph 2014). This session seeks to highlight recent work in data-driven approaches to the issues of diversity and equity in archaeology through the theme of publications and grants. Suggested topics for this session include demonstrated or recommended approaches to promoting diversity in submission rates; analyses or self-studies of submission demographics for grants or regional, national, or international journals (peer-reviewed or non-peer-reviewed); methodological complexities; and historical perspectives on inequities in the discipline.

[73] Symposium · PAPERS IN HONOR OF BRUCE BRADLEY

This symposium honors the career of Professor Bruce Bradley and his scholarly contributions to the studies of Paleoindian archaeology of the Americas, as well as experimental archaeology and Pueblo archaeology.

[74] Symposium · HISTORIES OF HUMAN-NATURE INTERACTIONS: USE, MANAGEMENT, AND CONSUMPTION OF PLANTS IN EXTREME ENVIRONMENTS

Historically, humans in every environment on Earth have incorporated plants into their lives, for a wide variety of purposes: diet, medicine, ritual, construction of homes, and crafting their tools, among others. Nonetheless, for several extreme environments (e.g., desert or temperate bioclimates), plants have not received the same attention in the archaeological research as other resources. An example of this is how these areas are usually portrayed as marginal, distant lands, where cultivars arrived late and where people adopted these products of human developments and innovations from other, richer areas. In this session, we want to explore these narratives, confront them with research done in extreme regions, and uncover new histories for the human-plant relationships in these kinds of environments. Topics such as adaptation of imported cultivars, innovations in cultivation techniques, and local processes of manipulation of wild resources and landscapes will form part of the central discussion. This symposium will strive to incorporate extreme bioclimates from all over the globe, and the whole chrono-cultural sequence, understanding that the

developments of the present ecosystems, diets, and cosmologies associated to plants did not start with agriculture but are rather several long-term cultural processes that have their roots in hunter-gatherer populations.

[75] Poster Session · PALEOINDIAN/PALEOAMERICAN ZOOARCHAEOLOGY

[76] Poster Session · ZOOARCHAEOLOGY

[77] Poster Session · DIGITAL ARCHAEOLOGY

[78] Poster Session · NEW DISCOVERIES IN MISSISSIPPIAN ARCHAEOLOGY

[79] Poster Session · ARCHAEOLOGY OF THE SOUTHERN SOUTHWEST

[80] Poster Session · BIOARCHAEOLOGY AND MORTUARY ANALYSIS

[81] Poster Session · CURRENT RESEARCH AT MCDONALD CREEK: A MULTICOMPONENT SITE IN INTERIOR ALASKA

McDonald Creek is a multicomponent site located about 30 miles south of Fairbanks, Alaska. Our research group began testing the site in 2013 and commenced full-scale excavations in 2016. The site contains three well-stratified cultural components, tentatively dating to 13.8 ka, 12.7 ka, and 5 ka and preserving tens of thousands of lithic artifacts, osseous materials, faunal remains, and paleoethnobotanical remains. In this poster session, we will present preliminary results from our work at the site, including stratigraphy, chronology, and site formation; lithic technologies from the Pleistocene and Holocene components; new IRSL methods using data from the site; spatial analyses; paleoethnobotanical analyses; and soil micromorphological analyses.

[82] Poster Session · NEW ARCHAEOLOGICAL INSIGHTS FROM THE MIDDLE TANANA VALLEY, ALASKA

Containing extensive preservation of over 14,000 years of human occupation, the Middle Tanana Valley, Alaska, continues to produce a wide array of archaeological investigations. The purpose of this symposium is to bring together and present new findings and research from this region on a variety of methods and topics that are being applied toward our understanding of the past 14,000 years of regional human occupation.

[83] Poster Session · EXPERIMENTAL ARCHAEOLOGY OF TRADITIONAL GROUND STONE MILLING TECHNOLOGY

Ground stone tools were crucial for increasing the amount and breadth of edible food stuffs in prehistory. Despite the favorable preservation generally afforded these tools and the central role they once had in processing many plant food staples, ground stone milling tools remain an understudied and undertheorized category of technology. This poster session highlights experimental approaches that explore investments of time, labor, or knowledge represented by ground stone milling tools in a variety of archaeological settings. The posters integrate experimental data on technological choices with archaeobotanical remains, use-wear analysis, ethnographic data, and a range of evolutionary models.

[84] Symposium · TEOTIHUACAN: MULTIDISCIPLINARY RESEARCH ON MESOAMERICA'S CLASSIC METROPOLIS

Teotihuacan, always an important presence in Mesoamerica, has recently regained the spotlight with new discoveries and research. This research comes from multiple fields and disciplines. In this multidisciplinary session, we approach the study of Teotihuacan through these multiple lenses in an attempt to create a cohesive image of the behemoth city of Mesoamerica's Classic period.

[85] General Session · NEW DISCOVERIES IN EUROPEAN ARCHAEOLOGY

[86] Symposium · RAISE YOUR GLASS TO THE PAST: AN ARCHAEOLOGY OF BEER

In its earliest forms, beer was vastly different from the beverage we enjoy today. The first written records noting beer are from the third millennium BCE in Mesopotamia and suggest that beer had been brewed and enjoyed in that region for hundreds if not thousands of years before. At its most basic level, beer was produced by the household, often brewed, fermented, and served in the same container, had an exceptionally short shelf life, and served both quotidian and feast-level consumption needs. What links these beverages from the ancient past to modern beer is the presence of ethanol, a psychoactive substance present in all alcohols that make this more than a simple drink. Through this symposium we explore beer's deep time past through a variety of eras and locations. Our goal is to highlight how beer has been brewed and used by people around the globe for millennia. Unhindered by modern definitions of beer as nothing more than barley, water, hops, and yeast, ancient peoples used their favorite ingredients to craft beer unique to them. These beverages were imbued with meaning and shared with both family and elite, as well as creating and maintaining relationships between people and the gods.

[87] Forum • ETHICS SHOULD CONCERN EVERYONE: SOLICITING MEMBERSHIP FEEDBACK ON UPDATING THE PRINCIPLES OF ARCHAEOLOGICAL ETHICS

(SPONSORED BY ETHICS REVISION TASK FORCE II)

The second SAA Ethics Revisions Task Force is charged with collecting input and feedback from SAA membership and stakeholder groups on existing ethical principles. This forum will provide a preliminary update on results from the 2019 membership survey and also solicit more member feedback on the SAA Principles of Archaeological Ethics. Organizers will present a brief overview of available survey results and then ask the audience to participate with their ideas, questions, and concerns. Discourse from this forum will be documented and included in the task force report used to guide revisions to the Ethical Principles.

[88] Forum • SPEED-MENTORING OFFICE HOURS AND PRE-PEER-REVIEW

(SPONSORED BY WOMEN IN ARCHAEOLOGY INTEREST GROUP)

After we finish graduate school, it is often difficult to find a suitable colleague who is willing to “talk through” or look over a manuscript before submission. And our friends and colleagues may not always be able to answer questions about grant-writing, interviewing, different kinds of careers in archaeology, fellowships, dealing with nonprofits, or doing community outreach. In this session, several volunteer mentors will be available to meet with individuals or very small groups to answer your specific questions on these and other issues. So far, mentors with experience in the American Southwest, South Asia, Central America, Oceania, and New England have volunteered; they also have experience with museum careers, careers in CRM, NAGPRA regulations, NSF grants, AAUW pre/postdoc fellowships, and other topics. Attendees who are seeking pre-peer-review advice for manuscripts and grants should have a draft already written, and they should come prepared to explain their research to a non-specialist. Mentoring sessions will begin and end promptly every 20 minutes during the two-hour session. Follow-up e-mail contact between mentors and attendees is up to the individuals involved; mentors may also provide possible referrals to another scholar. All SAA members are welcome.

[89] Forum • LEAVERITES AND CURATED COKE CANS: EXPLORING THE IMPACT OF NO COLLECTION POLICIES FROM THE PERSPECTIVE OF REGULATORS, CONSULTANTS, AND REPOSITORIES

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

Across the country, many regulatory agencies have implemented no collection or partial collection policies as a component of compliance with Section 106 of the National Historic Preservation Act and other laws. These policies vary widely with some focused on particular artifact classes or even specific types of undertakings. Despite recent work by the Archaeological Collections Consortium seen in the SAA Archaeological Record, vol. 19(1), there has been little evaluation of the effectiveness of these strategies in adequately and uniformly documenting cultural resources for management or the downline impacts on regulatory and repository decisions. While limited availability and rising costs of collections storage space, reducing overall project costs, and the patrimony of cultural objects have all been cited as reasons for no collection, in-field analysis, and collections re-burial, consideration of how this reduction in artifact collection will impact future research on and education about these collections remains understudied. There is also the question of whether a no-collection policy complies with the spirit of the laws underlying the recovery of archaeological materials subject to federal or other regulatory oversight. Join the Committee on Museums, Collections, and Curation for this forum of the strengths and limitations of no collection policies.

[90] Forum • THE COLOSSAL ILOPANGO VOLCANIC ERUPTION IN EL SALVADOR AND THE MID-SIXTH-CENTURY WORLDWIDE CLIMATIC CRISIS

Recent research indicates that, in terms of chronology, magnitude, and geographical location, the Ilopango eruption in Central America was one of two eruptions that caused the worldwide climatic crisis beginning AD 536 with distal effects that darkened the earth, brought on a 14-year cold spell in the northern hemisphere from Italy to Ireland, and led to crop failures from China to the Mediterranean and Mesoamerica. The event may have contributed to a major outbreak of bubonic plague in the Byzantine Empire. In Mesoamerica and Central America, effects of this catastrophe may have been felt from central Mexico to northern Colombia. Sometime around AD 539, Ilopango caldera provided a colossal Plinian eruption that had the proximal effect of blanketing an area of 10,000 km² with more than 80 km³ of pyroclastic flows and ash. The immediate impact zone included all of El Salvador and adjacent portions of eastern Guatemala, western Honduras, and southwest Nicaragua, within a radius of about 100 km from Ilopango. Major centers were temporarily abandoned in an area of 20,000 km². Trade routes in the southern Pacific regions of Central America were disrupted, and agricultural production was paralyzed for many decades.

[91] Forum • DIVERSE EXPERTISE: ON THE IMPORTANCE OF MULTIVOCALITY AND INCLUSION IN ARCHAEOLOGY

(SPONSORED BY COMMITTEE FOR THE STATUS OF WOMEN IN ARCHAEOLOGY, QUEER ARCHAEOLOGY INTEREST GROUP)

This panel consists of early career professionals—ABD graduates, recent graduates, and non-tenured junior faculty—in archaeology speaking on issues of diversity and inclusion in the discipline more broadly, and in the SAA organization specifically. Our goal is to highlight how a rising generation of scholars is committed to diversifying the field through not only our research focus but also our methodologies, pedagogies, and ethics. Archaeologists continue to face difficult cultural issues such as sexism and racism that require frank and productive discussions that move the discipline forward. The tension between a lack of inclusion and a regularly verbalized ideal toward diversity have shaped the experiences of (mostly) millennial archaeologists throughout their time in the discipline. Using their own real-world experiences, the panelists will discuss steps forward that the society can take to foster a better environment for the many people already working in the discipline and for future generations. The panel will share perspectives and create an action plan for an inclusive and optimistically innovative future in archaeology.

[92] Forum · DISCOVERIES, COLLECTIONS, AND TRAFFICKING: FEDERAL AGENCIES AND NAGPRA IN 2020: REFLECTING ON THE PAST THREE DECADES AND LOOKING TO THE HORIZON

Federal land managing agencies implement three key sections of the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) addressing Native American human remains and cultural items: documentation of agency collections; planning for, and response to, new discoveries on federal and tribal lands; and enforcement of trafficking. With 2020 marking the 30th anniversary of NAGPRA, this forum brings together agency participants, tribal representatives, and other partners to reflect on three decades of experience to align and integrate requirements with mission programs. In identifying factors for success and methods to overcome challenges in federal agency NAGPRA compliance, panelists highlight the fundamental contributions of the archaeological community and the critical role of tribal consultation. Through a facilitated discussion among the panel and audience, this session offers an opportunity to address critical topics and emerging issues in NAGPRA compliance, including inventorying collections from over 100 years of archaeological excavations and working with museums and universities in the U.S. and overseas; aligning with streamlined review for land use (e.g., NEPA, NHPA Section 106) and navigating processes with other authorities applicable to land management, including cross-jurisdictional projects; and sequencing with enforcement activities (e.g., ARPA) and coordination with law enforcement.

[93] Forum · A HOLE IN THE FIELD: ANCIENT MAYA STORAGE TECHNOLOGY

No archaeologist would ever dispute that the ancient Mayas developed a complex agricultural civilization. Likewise, all archaeologists agree that agricultural societies developed storage technologies. Yet, doubt often arises when the question of storage is posed in ancient Maya contexts, often framed by the challenges of curating perishables in (sub)tropical climates. But is it truly possible for a civilization to have lasted for millennia without efficient storage technology? To what degree did the ancient Mayas rely on storage for their nutritional well-being? Beyond reservoirs and “chultunes,” where did the ancient Mayas safeguard their goods? Did centralized storage facilities play a political-economic role for Classic Maya royal courts? Participants to this forum will present and explore the evidence for ancient Maya storage of foodstuffs, water, commodities, and more precious items from interdisciplinary perspectives, including ceramic and lithic studies, architecture, art history, epigraphy, paleoethnobotany, and geoarchaeology. In doing so, discussants will evaluate the potential for a more focused study of ancient Maya storage technology.

[94] Symposium · BRONZE CRAFT AND TECHNOLOGY: THE TRANSFORMATION OF ANCIENT CHINESE CULTURE INTO THE PHYSICAL WORLD

Archaeological artifacts are objects transformed from the natural world into their cultural context, but what does this transformation entail? How these artifacts came to be, and the knowledge involved, was the focus in our discussion of artisans last year. However, the topic of artisans is far more complex than knowledge itself. This year we would like to build upon the concept of knowledge and incorporate how this knowledge was influenced by their culture in producing the artifacts from the mental world into the physical world. By combining our discussion across different artifact types, we can further our understanding of the ancient Chinese artisans' relationship with their cultures. This session will discuss recent archaeological discoveries and research on Chinese crafts and technology, while bringing the artisans' methods of production and their cultural meaning into the forefront, therefore witnessing how the artisans of ancient China transformed their culture into the physical world.

[95] Lightning Rounds · DIGITAL ARCHAEOLOGY LIGHTNING TUTORIALS

(SPONSORED BY DIGITAL DATA INTEREST GROUP)

Amid the rapidly changing technological landscape, many archaeologists find it challenging to learn new digital skills and keep abreast of emerging tools. This session includes short “lightning tutorials,” or demonstrations of tools, techniques, and methods. Presentations will be geared toward archaeologists with beginner to intermediate digital abilities and experience. Attendees can expect practical resources to accomplish everyday tasks, including, but not limited to, making research accessible, collecting data in the field, 3D imaging techniques, outreach, and analysis tools. Discussion will be flexible and responsive based on topics identified by the participants and audience members. Supplementary resources about tools and skills discussed will be available at <https://saaddig.github.io/lightningtutorials/>.

[96] Lightning Rounds · INTERTWINED HISTORIES: HOW THE SAA SHAPED NAGPRA AND HOW NAGPRA IS SHAPING THE SAA

(SPONSORED BY COMMITTEE ON REPATRIATION)

From the creation of statutory definitions that were used in NAGPRA to the recently created repatriation interest group, the SAA has played a key role in the development and implementation of NAGPRA. In turn, NAGPRA has significantly impacted the SAA. In this session, we review the role of the SAA in the task force, the passage of NAGPRA, the Review Committee, public comments, and its continuing efforts to support NAGPRA through research, education, and committees/task forces. Presenters will discuss the ways that NAGPRA has changed archaeological practice and the SAA, including new collaborations, changes to the research questions and design, and changing codes of ethics. The paradigm shift continues with the increase in collaborations, indigenous archaeology, and international repatriations. How much has SAA influenced NAGPRA, and how much has NAGPRA influenced SAA?

[97] Symposium · COLLABORATIVE AND COMMUNITY ARCHAEOLOGY

This session focuses on archaeology projects involving varied and innovative collaborative efforts that focus on partnerships with local communities, especially tribal colleagues and related governments.

[98] Symposium · INNOVATING ARCHAEOLOGY AND FOSTERING SCHOLARSHIP: PAPERS IN HONOR OF STEPHEN E. PLOG

The papers in this session honor the career and legacy of Stephen E. Plog upon his retirement. His work spans nearly five decades. A U.S. Southwesternist by birth and training, most of Plog's research has focused on Ancestral Pueblos. Plog's first publication appeared in 1976, setting the stage for what would become enduring areas of interest: developing novel quantitative methods to answer questions about demography, social structures, and social interaction. Early in his career, he developed formal methods used for field survey (Black Mesa Project) and pioneered new approaches to ceramic stylistic attribute analysis. In later decades, his work expanded to include ceremonial and ritual dimensions of Puebloan archaeology, contributions to archaeological theory, and the development of the Chaco Research Archive. Plog's accomplishments have been acknowledged through his induction into the National Academy of Sciences and the American Academy of Arts and Sciences. This symposium, however, focuses on and celebrates his profound impact as a mentor. Former students and colleagues present research inspired by Dr. Plog's career.

[99] Symposium · NOTIONS AND STRATEGIC USES OF PERSONHOOD AND SOULS AMONG EARLY WOODLAND, MIDDLE WOODLAND, AND POSTCONTACT INDIANS OF THE EASTERN WOODLANDS

Inspired by the work of ethnologist A. Irving Hallowell and more recent developments in the study of non-Western peoples' ontologies, we document precontact and postcontact Woodland Indians' ideas about the constituents and characteristics of a "person." We explore how these notions were expressed in mortuary rituals, were a foundation for intergroup interactions, and were sometimes used strategically to create productive intergroup relations. Major themes that crosscut the presentations are (1) the central place of ideas about soul-like essences in concepts of the person; (2) the inclusion of other-than-human beings in the cultural category of person; and (3) the implications of these two facets of personhood for intercommunity alliance formation, place-making, and issues of "territoriality."

[100] Symposium · WHEN THE WILD WINDS BLOW: MICRONESIA COLONIZATION IN PACIFIC CONTEXT

Micronesia is a vast region composed of thousands of smaller islands scattered across nearly three million miles of ocean in the northwestern tropical Pacific. With few exceptions, however, Micronesia has received relatively little archaeological attention compared to other parts of Remote Oceania, despite islands having been settled in a complex series of dispersals spanning millennia, some of which are contemporaneous with Lapita and others that derive from descendant Lapita populations. While recent advances in different analytical techniques and theoretical perspectives provide a more nuanced picture of how peoples first colonized these smaller islands and subsequent events that occurred thereafter, this session provides new insights into how and when Micronesia was colonized and addresses lingering unanswered gaps with which to focus future research. The session also highlights issues in preserving and protecting the region's cultural heritage in the face of development, climate change, and other natural and social processes.

[101] Symposium · THE BIG BEND COMPLEX: LANDSCAPES OF HISTORY

The Big Bend region of west Texas in the United States and Chihuahua and Coahuila in Mexico is an area of great archaeological, ecological, and historical significance for both countries. Unfortunately, not enough research has been conducted on this region, especially on the Mexican side. This session will be examining this region from prehistory to the present and showing the cultural diversity of different communities that made the Big Bend their home.

[102] Symposium · ANCIENT MESOAMERICAN POPULATION HISTORY: DEMOGRAPHY, SOCIAL COMPLEXITY, AND CHANGE

Establishing ancient population histories and determining how the ancient populations were distributed across the landscape over time constitute two of the most pressing problems in archaeology. Mayanists have traditionally established population numbers using a model of individuals per structure or residential group, but without full agreement on methodology about how to consider time, function of constructions, or family size. In other parts of Mesoamerica, such as in Oaxaca and the Valley of Mexico, population estimates are done differently. Yet no matter how they are accomplished, without comparably established population histories, it is difficult to talk about levels of complexity and organization, carrying capacity and sustainability, and change over time. Indeed, our very interpretations about how ancient societies were structured are to a large degree predicated on how many people lived within a given center or polity. With the application of lidar helping demographic considerations, the creation of new archaeological data relating to households, and larger site survey samples, it is an appropriate time to re-evaluate ancient population history. This session hopes to re-engage Mesoamerican scholars in formulating new approaches to gaining information on past populations and the modeling that derives from such an exercise.

[103] Symposium · PALEO LITHICS TO LEGACY MANAGEMENT: RUTHANN KNUDSON'S BROAD REACH IN AMERICAN ARCHAEOLOGY

Ruthann Knudson exploded on the archaeological stage with an analysis of employable units (EUs), one of her lasting legacies to lithic technology, applied in the first case to Paleoindian studies. She can also be credited for initiating the publication of the Newsletter of Lithic Technology, today the international journal Lithic Technology. Her interest in lithics never waned, although she moved on to many other topics during her life, returning to lithics at the end of her career. She left a lasting legacy in government affairs, education, Native American cooperation, and many other contemporary topics. During much of her career she championed women's and feminist issues, both in terms of the structure of the field and in her studies, providing significant influence on female students. However, her mentorship and encouragement extended to all budding archaeologists. This symposium covers current perspectives in many areas of interest to Ruthann and in which she made contributions.

[104] Symposium · ADVANCES IN DIGITAL ARCHAEOLOGY PRACTICE

This organized session highlights advances in digital archaeology practice with case studies that encompass the entire digital data lifecycle from documentation to analysis, dissemination, and reflection/critique. Individual papers present innovative new workflows for the 3D scanning and virtualization of heritage places and material culture with terrestrial laser scanning, photogrammetry, and structured light scanning. These digital methods open new avenues for the technical documentation of built environments, enabling advanced visual and spatial analysis of features such as prehistoric cave paintings, mosaics and frescoes, urban locales, lighthouses, and military encampments, among others. In addition, aggregating digital data in open, searchable platforms increases the scale at which the scholarly community and public audiences gain access to access and engage with heritage resources, which alters the process of archaeological knowledge production. Several presentations consider the outcomes of advances in digital archaeology on various communities of practice—including educators, youth audiences, indigenous groups, local heritage organizations, and national and international institutions.

[105] General Session · ARCHAEOLOGY OF THE ANDES: THE MIDDLE HORIZON AND BEYOND**[106] Symposium · THEM AND US: TRANSMISSION AND CULTURAL DYNAMISM IN THE NORTH OF PERU BETWEEN AD 500 AND 950: A VISION SINCE THE RECENT NORTHERN INVESTIGATIONS**

This symposium looks, in part at the recent archaeological works, to analyze and understand the territorial dynamic, and the conception that a cultural group had of the others in the valleys of the north coast, the northern mountain range, and the eastern flanks of the Andes that developed into the groups of the Moche, Huamachuco, Cajamarca, and the (Pre)-Chachapoyas. We will focus on the regional processes, but without losing sight of the Wari presence and the different dimensions of their interactions with the northern villages. We will discuss aspects of the verticality and horizontality in the Peruvian north, starting with the mobility of goods, diffusion of ideas, populational displacement, stylistic integrations, and the local transformations of foreign elements.

[107] Symposium · CHANGING PERCEPTIONS: CASE STUDIES IN GEOPHYSICAL SURVEY

Geophysical survey applications in archaeology are becoming increasingly mature and mainstream and are now routinely changing our perceptions of ancient lives, sites, and landscapes. Multisensor instruments, real-time positioning systems, and user-friendly data analysis and visualization tools are opening wider and more richly detailed views into the past. This symposium highlights case studies from recent geophysical surveys in the Americas, Europe, and beyond. In each case, our perception of the archaeological record is changed, leading to new understandings of long-ago lives, new awareness of landscape-scale connections, new approaches to heritage management, or new public appreciation and engagement with the testimony of the past. This session will explore the impacts of these changing perceptions.

[108] Symposium · THE IRON AGE OF NORTHWEST PORTUGAL: LEFTOVERS OF BEHAVIOR

Archaeology is about objects and behavior. We leave our behavioral imprint in the things we think, invent, make, modify, and with which we interact. Materiality and its archaeological leftovers speak of the ways people in the past construct their world and in turn were shaped by that construction. These (now) social truisms are the backbone of inferring patterns of behavior. The papers in this session address various aspects of the multidimensional qualities of materiality using divergent thinking to consider past patterned behavior.

[109] Symposium · UNEARTHING PANDORA'S BOX: ADDRESSING THE CONTEMPORARY ETHICS OF PRECOLUMBIAN MUSEUM COLLECTIONS

Precolumbian objects have experienced complicated histories since their procurement began after the contact period. This session will examine how archaeologists, art historians, and museum curators manage precolumbian collections in museum and university settings, using contemporary ethical frameworks. These frameworks force us to confront the act of taking these objects, their lack of historical context, and their displacement in repositories and museum exhibits. Issues examined will include the use of precolumbian objects in research considering their lack of archaeological context; the relationship of curators and archaeologists to public collections; developing pedagogical initiatives between museums and universities, local communities, and/or indigenous groups; approaches to the acquisition and display of precolumbian works; and addressing the futures of problematic objects. We will also consider the ethical conundrums related to the fate of collections that are not on display and issues related to deaccession.

[110] Forum · SOCIAL AND ECONOMIC THEORIES IN ARCHAEOLOGY: TENSIONS AND POTENTIALS

This forum proposes brings together global attempts to reconcile the debate on the ancient economy. It discusses the application of economic and social theories in archaeology. We seek to investigate the usage of the empirical and qualitative socioeconomic analysis in archaeology by looking at their application in peripheral or "non-canon" historical landscapes. We will be looking at the usage of sources and source interpretation in the multidisciplinary application of theories on "archaeological data." The discussion will focus on topics such as the application of "neoclassical" economics theories that are growing popular among economist and economic historian utilizing trade, settlement, and production data in archaeology. This has resurfaced theoretical tensions between other disciplinary theories such as Marxist historical interpretation, economic anthropology, and sociology. We seek to bring together a wide range of case study in the hope of establishing some clarity to the debates on "social and economic" structures in the ancient world.

[111] Symposium · TOWARD AN INTERNATIONAL COOPERATION FRAMEWORK FOR ROCK ART RESEARCH (SPONSORED BY ICOMOS, UNESCO)

Research into rock art now requires a range of specialized skills. While typically coordinated by an archaeologist, rock art projects increasingly involve team members from different disciplinary and professional backgrounds. For rock art conservation and dating, a

mix of chemistry, geology, and materials science are needed; for management, a range of sociological, business, and facilitation skills are required. Even the previous exclusive domains of the archaeologist, such as recording and interpretation, today often involve people with a range of technological skills and backgrounds in areas such as cognitive science, history, and anthropology. With limited human capacity at specific rock art locales, there is a urgent need for transnational and international cooperation and mutual support. This session is designed to plan the future of such collaboration and the role that international organizations, such as UNESCO and ICOMOS, should play in facilitating this multilateral endeavor. We seek presenters from different regions to present their recommendations on areas in which we can most productively improve international best practices and where pooling of resources and experiences can be most beneficial. The outcomes of this session will guide us in the creation of future international rock art networks to address areas of pressing need.

[112] Symposium • THE ARCHAEOLOGY OF BUILDINGS IN COLONIAL CONTEXTS

The papers in this session present a variety of buildings-based research from colonial contexts. Dealing with issues ranging from architectural complexities, urban/rural differences, the commercial and social importance of buildings, and the hybrid quality of buildings in colonial contexts, the various authors provide richly detailed case studies. All of the studies in the session are the result of long-standing research programs that have examined the dynamic quality of colonial settings and the materialities they engender. Papers in the session examine a variety of building forms from the early Spanish period in New Mexico, colonial-era New England, and the Plantation Period in Ireland. Reflecting a variety of perspectives, these papers examine hybrid architectural forms that draw on the building traditions of the colonized and colonizers alike, as well as complex colonial buildings that served the commercial and residential needs of both English and Spanish colonists. Collectively, these papers focus on the spatial configurations of a variety of building types, the challenges that confront archaeologists engaged in this type of research, and the importance of weaving diverse architectural forms into deeper understandings of the dynamic quality of colonialism and its continuing legacies throughout the world.

[113] Forum • TEXAS TRIBAL PERSPECTIVES: COLLABORATIVE EFFORTS IN ARCHAEOLOGY, HISTORY, TRADITIONAL CULTURAL PROPERTY STUDIES, AND CULTURAL RESOURCE MANAGEMENT

Federally recognized tribal nations and Texas agencies share their lessons learned and current work on the cultural history of the state. The consultation process is a springboard to new ideas and approaches inclusive of archaeology and history. In this forum, tribal preservation professionals from the Alabama-Coushatta Tribe, Kickapoo, Mescalero Apache, Tonkawa Tribe, and Muscogee Creek Nation join agency representatives to discuss their work on projects ranging from the Texas Department of Transportation's tribal history project and Tribal Advisory Board, the Alamo's efforts to create a Tribal Committee, Texas Parks and Wildlife's plans for tribal engagement and improved state park interpretive materials, and the Texas Military Department's Traditional Cultural Property surveys and proposed project to integrate tribal field crews for site monitoring and survey.

[114] Forum • REGIONAL LEADERSHIP FORUM

This year's forum will explore how regional professional organizations have reacted, or could consider reacting, to recent changes at SAA and our regional meetings related to anti-harassment policy. Membership requirements, bylaws, and grievance processes will be discussed, as well as the relationship between these smaller-scale organizations and SAA and the field of archaeology as a whole. The goal of the forum is to share experiences and to develop positive solutions to our common problem of promoting safe and ethical membership bodies. Leadership from a range of regional professional organizations, SAA, and RPA will be participating.

[115] Forum • GLOBAL COLLABORATIVE EFFORTS TO ADDRESS ISSUES FACING MODERN SOCIETY

Working in multidisciplinary teams is nothing new to archaeologists. Working in collaborative teams, composed of scholars of differing backgrounds, genders, and professional statuses, however, is rare. Yet, this form of collaboration is the cornerstone of synthesis centers that have transformed sciences such as ecology, mathematical biology, and geoscience. Studies have shown that addressing major societal issues requires the kind of transformative thinking fostered by this collaborative model. Professional societies, such as the SAA, EAA, and SHA, are keenly aware that they, too, must collaborate to harness the full potential of our discipline to address deep-time issues that continue to impact modern society. The Coalition for Archaeological Synthesis (CfAS), the discipline's first synthesis center, counts these major professional societies among its partners and has worked with them and other partners to define projects to bring the power of collaborative synthesis using archaeological data to bear on major issues of our time. In this forum we will present examples of the types of projects CfAS has sponsored and then, in a workshop-like setting, engage the forum's audience to help design new projects and new initiatives that will have an impact on local and national policies.

[116] Forum • DIGITIZING SENSITIVE SITE DATA: SUCCESS STORIES AND SIGNIFICANT CONCERNS IN SOVEREIGNTY-DRIVEN DATA MANAGEMENT BY TRIBES AND THEIR PARTNERS

Proposals for regional or national archaeological site and cultural resource databases invoke bright promises of research and resource management efficiencies as well as serious questions regarding information ownership, system security, and unintended consequences. The National Trust for Historic Preservation has encouraged consideration of the NatureServe environmental platform; Digital Antiquity and other entities are promoting centralized, ultimately comprehensive databases to serve multiple interests. Tribes and preservation advocates want data security, consideration of the full spectrum of cultural resources, and other assurances. Governments and project proponents want readily accessible information on cultural resource locations to streamline project planning. Researchers want to harness technological innovations to enable new types and levels of analyses. As the owners, managers, and sources of cultural resource information, tribes require opportunities to participate in all discussions and decisions regarding centralized databases and the implications these digital systems have for cultural resource management, consultation, research, and flexibility to accommodate data sovereignty, traditional cultural properties, and other legitimate interests and concerns. Further progress toward regional and national cultural databases is contingent on candid and good-faith deliberations leading to the harmonization of diverse interests.

[117] Forum · ARCHAEOLOGICAL APPROACHES TO ANTHROPOGENIC FIRE AND GLOBAL PYRODIVERSITY

Archaeological research consistently demonstrates that humans have played an active role in shaping long-term fire histories in ecosystems throughout the world. The growing number of archaeologists engaged in understanding human-fire-ecosystem relationships has led to a multitude of new methods, analyses, and theoretical frameworks in our field. However, the diversity of approaches to anthropogenic fire often means researchers are dispersed throughout multiple sessions at the SAA annual meeting. In this forum, we will bring together this research community to highlight the innovative approaches archaeologists are using to meet the challenge of conceptualizing anthropogenic fire and pyrodiversity in the archaeological record. Brief presentations by panelists will provide a summary of the current "state of the field," leading to an opportunity for archaeologists from multiple research backgrounds and geographic foci to engage in open discussion on how we move this work forward.

[118] Forum · TROWELS, BLOGS, AND PODCASTS: THE EXCITEMENT AND CHALLENGE OF MEDIA USE IN THE INFORMATION AND MISINFORMATION AGE

(SPONSORED BY MEDIA RELATIONS COMMITTEE)

In this age of information and misinformation, archaeologists highlight the importance and relevance of archaeology to the modern world. We strive through our work to draw lessons from the past to better understand our present and future. Often the rigor of our research does not translate into user friendly reads for the general public. Increasingly, archaeologists are using the new information tools at our disposal as well as more traditional media of mass communication to make our work better known and to prevent misinformation from spreading. At the same time, these tools are novel ways to introduce new audiences, including school-age youth, to the fascinating world of archaeology. This session is organized by the Media Relations Committee and welcomes audience participation in a discussion on archaeologist's use of media to engage the public and the challenges also posed by the use of such media.

[119] Poster Session · ARCHAEOLOGY OF THE CONTACT PERIOD**[120] Poster Session · CERAMIC STUDIES****[121] Poster Session · LANDSCAPE AND IDENTITY IN PREHISPANIC MEXICO: A VIEW FROM THE EDGE**

Despite its vast territory, Mexican archaeology has largely been structured and organized from the capital. In this session, we take a decentralized look at embodied everyday life at a variety of sites outside of central Mexico along the southeastern and northwestern edges of the modern-day nation. We consider notions of identity, subsistence, and symbolism, from a landscape perspective, to demonstrate how the people of the past constructed complex and varied worlds in their particular locales.

[122] Poster Session · RESEARCH HOT OFF THE TROWEL IN THE UPPER GILA AND MIMBRES AREAS

The Upper Gila and Mimbres region continues to be one of the most active areas of fieldwork in U.S. Southwest archaeology, with numerous projects affiliated with different institutions investigating sites dating throughout much of the prehispanic sequence. In this session, researchers from ongoing field projects in this region present preliminary results and discuss their implications for craft specialization, food preparation and storage, religion, settlement patterns, mobility, and other research topics of broad interest.

[123] Poster Session · SCALING POTTING NETWORKS: RECENT CONTRIBUTIONS FROM CERAMIC PETROGRAPHY

Ceramic petrography has stood the tests of time as an analytical technique partly due to its versatility. Few pottery analysis techniques simultaneously provide archaeologists information on provenance, manufacturing choices, and social practices. Petrographers have made substantive contributions to anthropological and archaeological literature over the last two decades by viewing the complex technologies associated with pottery production from multiple angles. Particularly compelling has been petrography's role in disentangling the social networks that underwrote past pottery production practices and exchange. Pots themselves are the outcome of individual or collaborative practices that are governed by larger social bodies, such as kinship systems or religious sodalities. The case studies presented here attempt to decipher pottery production practices by situating potters within the broader networks in which they operated. Our goal is to showcase through diachronic, cross-cultural analyses the utility of using all aspects of petrographic analysis to better understand past potting networks. We ultimately use these case studies to demonstrate how network-based archaeology can benefit by employing a multifaceted petrographic approach.

[124] Symposium · FINDING FIELDS: LOCATING AND INTERPRETING ANCIENT AGRICULTURAL LANDSCAPES

Archaeological analysis of ancient agricultural fields can provide key anthropological insights into past subsistence strategies, communities' political economies, environmental entanglements, and ideologies of land, labor, and gender. And yet the subtle traces of agricultural fields (e.g., field boundary features, stone clearance mounds, anthropogenic soils, and artifact scatters) are among the most difficult features to resolve archaeologically. Moreover, the expansiveness of ancient field systems combined with their often ephemeral nature make agricultural landscapes a serious challenge to preserve and protect as they are easily lost to erosional processes and modern development. This session brings together a group of scholars employing innovative new methods to discover, map, and interpret ancient field systems. These new approaches to fields explore the social and political contexts of agriculture, challenge colonial narratives about indigenous field systems, and engage with emerging global discourses of the Anthropocene.

[125] Symposium · RISKY BUSINESS: COMPARATIVE APPROACHES TO RISK AND RESILIENCE IN DRYLAND ENVIRONMENTS, PART 1

Part 1: Drylands currently make up 47% of the Earth's surface and host 39% of the world's population. Recent climate models predict that by the end of this century, 20%–30% of the planet will be significantly drier. As our planet experiences more rapid global warming, arid landscapes become increasingly widespread. Such landscapes can no longer be considered marginal and/or inimical to human lifeways. Instead, drylands should continue to be at the forefront of research agendas, as landscapes simultaneously of risk, vulnerability, resilience, and potential. These are not homogeneous landscapes but complex and diverse ecosystems that interact with each other and their inhabitants.

[126] Symposium · ANCIENT MESOAMERICAN EXCHANGE SYSTEMS AND ECONOMY: BUILDING ON THE WORK OF RONALD BISHOP, PART 1

Application of neutron activation analysis (NAA) to archaeological materials started in the 1960s. Yet it was in the 1970s that INAA really took off when the field recognized its great potential for study of exchange systems and economies. That occurred in large part due to the influence of an early adopter in archaeology, Ronald L. Bishop. With his unique background, Bishop coupled a chemist's understanding of the technique with an archaeologist's and anthropologist's understanding of what constituted an important problem. He also recognized that meaningful interpretation of precise chemical and mineralogical characterizations of ceramics required understanding the ceramic studies of collaborating archaeologists and the full culture-historical context of samples. Over four+ decades, Bishop and his collaborators have brought hard data to the study of material-exchange systems across Mesoamerica, from the southern periphery in Nicaragua to the northern periphery in the U.S. Southwest. His contributions to understanding Maya economic systems have been particularly numerous and influential. To recognize his work and build upon it, a number of Bishop's current and past collaborators will report new results, evaluate interpretations, or synthesize studies that employ NAA or other characterization techniques to advance the study of Mesoamerican economies. First of two sessions.

[127] Symposium · PEOPLING THE ANCIENT AMERICAS: PERSONHOOD, ANIMISM, AND SACRED LANDSCAPES

Throughout the Americas, Indigenous people lived in a landscape teeming with life, recognizing degrees of personhood in mountains, volcanoes, caves, springs, rivers, rocks, plants, archaeological sites, trees, and animals. As more scholars grapple with the implications of this perspective in our investigations, community relations, and interpretations, the complexities and capacities of this animate world have begun to come into focus. This session highlights scholarship from across the Americas that confronts and unpacks Indigenous relations with these "other" persons. Papers will build upon the fundamental acknowledgment of the personhood or person-like qualities of this living landscape in order to examine how Indigenous peoples interacted with the non-human agents that populated their world. By recognizing the central role these relationships played in the lives of the people we study, this session explores the myriad ways in which nonhuman agents occupied and affected the ancient world, from land management and tenure to economics, politics, migration, pilgrimage, trade routes, conquest, ethics, and philosophy. It also considers how the living landscape manifested, maintained, and structured relationships with ancestors and the past, as well as the ways in which it shapes (or should shape) current archaeological practice when scholars engage with descendant communities.

[128] Symposium · REMAKING MAYA CIVILIZATION: SOCIAL AND POLITICAL TRANSFORMATIONS IN THE PROTOCLASSIC MAYA LOWLANDS

The centuries spanning the transition from the Preclassic to the Early Classic periods in ancient Maya history, what many scholars observe as the Protoclassic (ca. 100 BC–AD 300), witnessed a profound reorganization in the lowlands: populations declined and relocated, political fortunes realigned, and material culture traditions differentiated along lines of class and geography. While it is now widely accepted that complex urban polities preceded the emergence of Classic Maya civilization, there has not been a comprehensive examination of how these societies were transformed and reconstituted during the Protoclassic, even as it has become clear that such an effort is crucial for understanding why Classic Maya civilization took the shape that it did. The papers in this session explore processes involved in major changes at various analytical scales, including macro-scale (e.g., climate change, regional population movements), meso-scale (e.g., cities and neighborhoods, warfare), and micro-scale (e.g., households), to understand how Classic Maya civilization emerged from its Preclassic predecessor, and explain why Classic institutions followed the paths they did. This session provides insights into collapse, transformation, social memory, and resilience during times of stress in complex societies.

[129] Symposium · BIRDS IN ARCHAEOLOGY: NEW APPROACHES TO UNDERSTANDING THE DIVERSE ROLES OF BIRDS IN THE PAST

Recent research in social zooarchaeology has demonstrated the diverse, reciprocal nature of relationships between animals and humans in the past. Despite growing interest in avifaunal remains from archaeological contexts, birds are often understudied and undervalued compared to other classes of fauna. Birds played particularly multifaceted roles in many realms of prehistoric life. Human interaction with birds has been driven by concerns for subsistence and cuisine, economic production and trade, political legitimization and social status, decorative and artistic pursuits, and religion, ideology, and ritual practice; analysis of their remains and archaeological contexts can inform the study of almost every traditional aspect of archaeological research. The outcomes and implications of these interactions, including extinction and extirpation, effects on the environment and local bird populations, and changes in biogeography over time, extends the relevance of avifaunal studies beyond the archaeological spectrum to other social and natural sciences. The papers in this session demonstrate the wide range of research topics that avifaunal analysis can address, and the diverse ways in which birds were involved in prehistoric life. The breadth of this research demonstrates the great explanatory potential of the study of avifaunal remains and the relevance of these inquiries to a social zooarchaeology.

[130] General Session · NEW RESEARCH IN CLASSIC MAYA ARCHAEOLOGY

[131] Symposium • FRYXELL AWARD SYMPOSIUM: PAPERS IN HONOR OF DEBRA L. MARTIN
(SPONSORED BY FRYXELL COMMITTEE)

Professor Martin's extraordinary achievements in anthropology have crossed interdisciplinary boundaries to unpack the complexity of human experiences through direct archaeological and osteological analyses, theoretical scholarship, exhaustive publications, and her leadership across disciplines and within her teaching and mentoring. Her research has transformed our understanding how violent events are shaped, used, and experienced by people in the past, highlighting how violence impacts the lives of those on the margins. She is a role model in how to perform engaged, ethical, and forward-moving research. This session celebrates the ways her teaching, mentorship, and collaborative work has impacted her students and colleagues. The papers presented here reflect on Dr. Martin's rock-steady mentorship, leadership, and collaboration in the ways we all work to read the past and strive for humanistic and scientific models of inquiry, and consider our own research questions. She has significantly reshaped the field of bioarchaeology, biological anthropology, biocultural studies, and forensic sciences. She shows by example not only how to do good anthropology but how to be a good anthropologist. We take tremendous pleasure in sharing our experiences and scholarship to recognize Dr. Martin in honor of the Fryxell award.

[132] Symposium • A CAREER ON AND OFF THE SHELF: DR. MICHAEL "SONNY" TRIMBLE, FROM CURATION TO FORENSICS AND POINTS IN BETWEEN

This symposium celebrates Dr. Michael "Sonny" Trimble's career, which has spanned more than 40 years. Since the 1970s, archaeology has changed significantly, and Dr. Trimble has been on the forefront of many of those changes, especially in regard to implementing innovative field techniques, helping to uncover the curation crises, and developing unique solutions to advance the realm of collections management. As the founding and long-term director of the U.S. Army Corps of Engineers' (USACE) Mandatory Center of Expertise for the Curation and Management of Archaeological collections, Dr. Trimble and his team supported POW/MIA recovery missions, directed the Iraq Mass Graves project, established the Veterans Curation Program, and implemented USACE's National Regionalization Effort. The papers in this session seek to honor his career, his legacy, and his continued contributions.

[133] Symposium • CENTRAL MEXICO AFTER TEOTIHUACAN: EVERYDAY LIFE AND THE (RE)MAKING OF EPICLASSIC COMMUNITIES

The Epiclassic period, from about 550 to 850 CE, was a time of extraordinary social, political, and economic change in central Mexico. The Teotihuacan state had broken down, its governing institutions dissolved, and the population of its capital diminished to a fraction of its former size. The release of Teotihuacan's grip over the surrounding region transformed a formerly consolidated subject territory into a fractious sociopolitical landscape coping with instability and conflict. However, this was also a time of remarkable innovation, growth, and resilience, as people moved, formed new communities, restructured networks of exchange, and adopted novel practices and institutions. In this symposium, we present recent and current research that examines these changes through diverse lenses, including everyday practices and material culture, landscape use and modification, and the sociopolitical and spatial organization of communities. Archaeological, biogeochemical, geophysical, and paleoethnobotanical research focusing on settlements near Teotihuacan and in surrounding regions will be discussed.

[134] Symposium • SHARED EXPERIENCES AND PERFORMATIVE BOUNDARIES: THE INTERSECTION OF TRAUMA AND MIGRATION

In the archaeological and historical record we see evidence of trauma and the impact of upheaval on communities through both natural disaster and interpersonal violence. Scholars have explored the strategies and institutions, such as religion and government, that may contribute to regrouping of individuals, households, and societies. Migration may be connected to negative life events, and both trauma and migration are significant factors in the formation of community identities. In this session, we explore how past people experienced mobility, perhaps as a means to respond to these life-changing events. However, mobility may have also contributed to traumatic events in the lives of individuals and the community. The case studies examine the links between identity, migration, and trauma in the archaeological and bioarchaeological record. Further, these papers focus on ways in which migration and trauma form the performative boundaries that define identities in past communities.

[135] Symposium • THE BIG PICTURE: MULTIPLE PERSPECTIVE CHRONOLOGIES WITH BAYES AND BEYOND

The Bayesian approach for chronology building has become increasingly applied over past decades to better understand archaeological activity at different spatial and chronological scales. Common techniques for big chronological understanding with Bayes range from the evaluation of multiple independent settlement chronologies to singular multi-site models. Whereas, commonly used non-Bayesian approaches include summed probabilities or the mass calibration of measurements. Whatever method used, big chronology often aims to (1) explore diachronic cultural and demographic change, (2) develop large-scale historical narratives, and (3) address regional-specific issues of high intrinsic interest (environmental impacts, the development of cultural complexity, warfare, migration, depopulation, etc.). This session brings together papers that explore Bayesian-informed chronologies that aim to address larger-scale questions and grapple with the unique challenges related to modeling techniques and absolute dating. The goal of this session is to provide a platform for discussing and further evaluating the different chronological perspectives that modeling provides for big picture archaeological questions. An additional goal is to further consider how to best incorporate emerging and more specialized modeling approaches, such as wiggle matching, kernel density estimation modeling, and simulation experiments, into large-scale archaeological interpretation.

[136] Symposium • STRUCTURE AND MEANING OF MOGOLLON COMMUNAL SPACES AND PLACES IN THE GREATER AMERICAN SOUTHWEST, PART 1: MIMBRES, JORNADA, AND PAQUIMÉ

The ancient Mogollon people of southern New Mexico and east-central Arizona had rich spiritual and ritual lives based on the presence of communal-type structures dating from the Early Pithouse period through the AD 1400s. The best known are the large

"great kivas" at Pithouse period villages, but we know from decades of research that the Mogollon used a wide variety of communal-type structures ranging from extra-large pueblo rooms to plazas. With more recent work, we are beginning to better understand not just structural space represented by communal architecture but other kinds of ritual spaces, such as shrines, trails, and roads, for example, and how they articulate with the larger community and the landscapes surrounding them. Using insights gained from broader perspectives on Mogollon communal spaces and places, we are in a better position to understand cultural, social, and ritual meaning associated with them. This proposed symposium brings together the latest research on Mogollon communal and ritual spaces and places and will be of interest not only to American Southwest researchers but to all who have an interest in ritual behavior and action of ancient peoples.

[137] Symposium · THE SUBTERRANEAN IN MESOAMERICAN INDIGENOUS CULTURE AND BEYOND

Mesoamerican cultures proclaim the central importance of landscape in both architecture and iconography as pyramids and temples replicate hills and caves. These landscape features are magnets that attract people to them and structure activities around them. This session focuses on the subterranean and its influence on indigenous culture in Mesoamerica and the Southwest. Subterranean features are particularly significant to archaeology in often holding purely ritual assemblages that represents the field's best context for studying the archaeology of religion.

[138] Symposium · PLACE-MAKING IN INDIGENOUS MESOAMERICAN COMMUNITIES PAST AND PRESENT

Prehispanic Mesoamerican communities were defined by a shared identity based on a relationship to sacred geography and/or a charter with specific progenitor deities. Nahuatl-speaking communities were conceptualized as altepetl "water-mountain," a concept broadly shared across Mesoamerica. Classic Maya foundational narratives highlight a central water source, surrounded by four natural or artificial sacred mountains. Recent expressions of these concepts occur among the Tz'utujil Maya in highland Guatemala, where creation is said to have begun at Lake Atitlán, and in Yucatecan communities organized around cenotes. This session examines further examples of place-making strategies, focusing on prehispanic Oaxaca and the Guatemalan Petén; sixteenth-century communities in Guerrero, Oaxaca, and Yucatán; the late nineteenth-century Caste War period in Yucatán; and present-day communities in highland Guatemala. Strategies discussed include the creation of sacred space—and community building—through ritual processions and specific iconographic programs, the transfer of wealth to reproduce sociogeographic identities, mapping communal history to maintain control over lands, the performance of traditional rituals within built environments having European antecedents, enacting ceremonies to create living space by harnessing the energy within the natural and built world, and the performance of renewal rituals associated with caves and other places of emergence.

[139] Forum · TEACHING INTEGRITY IN EMPIRICAL ARCHAEOLOGY

(SPONSORED BY OPEN SCIENCE IN ARCHAEOLOGY INTEREST GROUP)

In recent years, many social science disciplines have been rethinking what it means to do scientific research with integrity, often in response to embarrassing revelations of accidental or deliberate false results and underpowered, irreproducible, and thus unreliable findings. Some of the steps that other disciplines have been taking to ensure integrity is making code and data available with research publications and standardized reporting of statistical test results. To ensure these improvements are sustainable, disciplines such as economics, political science, ecology, biology, and psychology have also been changing their teaching practices to prepare students with the skills to work with integrity. This includes teaching statistics with open source software tools and conducting replication assignments in the classroom. While archaeology has not experienced credibility crises similar to other fields, we have a lot to gain by adopting the improvements that other fields are making. In this forum we will explore how archaeologists are updating their curricula to teach a scientific archaeology that centers transparency and integrity. We will discuss the principles, pedagogy, tools, and techniques that are currently in use, how current practices can be improved, and some possible pathways for future work.

[140] Symposium · PALEOLANDSCAPES IN ARCHAEOLOGY: LESSONS FOR THE PAST AND FUTURE

Given the fact that landscapes have transformed through time, their long-term chronologies are essential for situating archaeological sites in their original contexts, developing accurate knowledge of the human past, and providing relevant examples for current and future management of changing climate and sea level. Worldwide, studies have shown how ancient people have interacted with substantial transformation in coastlines, forests, water sources, and overall habitat ecologies. This session's participants are encouraged to offer examples of how natural and cultural histories have inter-related through various challenges, toward identifying the factors that have been successful and unsuccessful for adapting through the changing world that we inhabit.

[141] Symposium · MAKING "MEANING": ARCHAEOLOGY, ART, AND THE LEGACY OF TERENCE GRIEDER

For 40 years, Terence Grieder taught art history in the Department of Art at the University of Texas in Austin, retiring as David Bruton Jr. Centennial Professor of Art History in 2000. As a specialist in Ancient and Latin American art, his scholarship was driven by a firm commitment to both the positive and negative aspects of the emerging hybridization of archaeological and art historical methodologies. Though known primarily for his work in the Andes, his scholarship spanned the broad temporal, cultural and intellectual range of the Americas, including Archaic rock art of the American Southwest, Maya ceramics, modern Latin American art of Mexico, and ancient Andean ceramics and architecture. We invite presentations that critically reflect or reconsider any aspect, positive or negative, of the techniques or influence of Grieder's early approach to the interpretation of ancient American culture, regardless of area or media focus. Topics may range from specific case studies to broader theoretical models.

[142] General Session · NEW DEVELOPMENTS IN PUEBLOAN ARCHAEOLOGY

[143] Symposium - APPROACHES TO THE ARCHAEOLOGY OF HEALTH: SEWERS, SNAKEBITES, AND SKELETONS

What is "health" and how do societies promote and create it? The WHO states "health" is defined not just "by the absence of illness but is a state of wellness, physically, mentally and socially." However, health is not a static concept and varies widely within and among cultures and settings. Moreover, health is negotiated between individuals, families, and communities, and between human and nonhuman populations. How can we examine conception(s) of health archaeologically? What can we say about health practices on an individual, neighborhood, and community level? And how can we investigate variations in health by race, class, gender, age, and species? Typically, archaeological approaches to health focus on identifying disease, malnutrition, or wounds through osteological analysis, and increasingly through aDNA. However, we also seek papers that examine other aspects of health such as preventative measures, wellness promoting activities, and healing. Topics could include water infrastructure, sanitation systems, spatial planning of hazardous activities, the construction of living environments, fire prevention, zoonotic outbreaks, trash disposal, the use of medicines, and healing practices, as well as bioarchaeological studies. Our goal is to make full use of the archaeological record to examine how health was conceived of, experienced, and enacted in the past.

[144] Symposium - LA CASA DEL LINAJE DEL ARMADILLO: RECIENTES HALLAZGOS EN TAMTOC, SAN LUIS POTOSI

During the 2015 field season, we excavated Structure F7, located within the group F, in the ancient city of Tamtoc, nestled in the Huasteca of San Luis Potosi. Both the elements of material culture and the offerings associated with the recovered human burials make it possible to suggest that it was a site of ritual importance within the sociopolitical structure of Tamtoc. At one end of the structure, an altar was located that contained the complete skeletal remains of an armadillo (*Dasypus novemcinctus*), providing a clear totemic message about the identity of those who were buried in the structure and also giving rise to the name of this session.

[145] Symposium - TECNOLOGÍAS APLICADAS Y MÉTODOS DE ESTUDIO EN LAS NUEVAS PERSPECTIVAS DE LA ARQUEOLOGÍA OAXAQUEÑA

Esta sesión presenta los avances en los estudios de la arquitectura y poblaciones antiguas del Estado zapoteco y sus zonas de influencia desde el Formativo Tardío hasta el Clásico Tardío, temporalidad que enmarca la aparición y abandono de Monte Albán. Los estudios que se presentan enmarcan múltiples intereses científicos, desde los derivados de la protección y atención del patrimonio en base a su amplio diagnóstico, hasta las diferentes líneas de investigación por diversos autores, empleando novedosos adelantos tecnológicos y técnicas de investigación para su registro y estudio. Entre los temas tratados se encuentran el estudio de la dieta de los antiguos pobladores, diferencias encontradas entre los diferentes pueblos y temporalidades; la composición química de ciertos minerales empleados en la elaboración de bienes suntuarios y por ende el conocimiento o reafirmación de redes de intercambio y comercio; avances en el conocimiento y empleo de técnicas de análisis y diagnósticos en la arquitectura prehispánica; rituales de abandono y cancelación de espacios; así como los recientes descubrimientos en cosmovisión y religión.

[146] Symposium - CLIMATE RESILIENCE AND ADAPTATION: METHODS, APPROACHES, AND CASE STUDIES

The implications of climate and climate change have throughout the longue durée presented a constant and complex concern for human societies. Resilience, defined as the capacity for socio-ecological systems to absorb stresses, adapt, reorganize, and evolve into new or more effective systems in the face of change or transformation has garnered much attention of late. Archaeology, a discipline with extensive capability for evaluating human/environmental relations, is well placed to add to interdisciplinary debates on these great societal challenges and synthesize adaptation, resilience, and transformation within the context of cultural and environmental disputes. With the rising awareness of climate change in worldwide societies, this session is designed to showcase approaches and interdisciplinary case studies for research into global climate related resilience and adaptation.

[147] Poster Session - ARTIFICIAL INTELLIGENCE, DRONES, LIDAR, AND MACHINE LEARNING: NEW APPROACHES TO ARCHAEOLOGICAL DATA COLLECTION AND ANALYSIS**[148] Poster Session - ARCHAEOLOGY OF THE NORTHERN SOUTHWEST****[149] Poster Session - ARCHAEOLOGY OF THE FOUR CORNERS AREA****[150] Poster Session - ARCHAEOLOGY OF MESOAMERICA****[151] Symposium - RETHINKING METHODOLOGIES IN ARCHAEOLOGY BASED ON DIVERSE EXPERIENCES IN GUATEMALA**

Recently, archaeologists working with indigenous communities of Guatemala have gone through difficulties to successfully conduct research. Given the diverse contexts in which archaeologists work, sometimes the situation becomes aggressive as a response of local communities to defend themselves by marking boundaries over contested cultural heritage. In this panel, we share our own experiences when conducting archaeology at four different communities by addressing these questions: What challenges have we faced during fieldwork that have forced us to question how appropriate are our methodologies? What does it mean to conduct archaeological research within contexts of hostile history? How are we interacting with people from communities? How are we defining "community" from our own experiences? This is an invitation to reflect on the diversity of methodologies that we use, on how we address dialogues and negotiations with populations associated with heritage to investigate their past, and how we navigate confrontations with the communities during fieldwork. Is this a matter of who conducts research? Or is it a deeper issue that has to

do with coloniality of knowledge? These questions are framed within an urgent need to develop a more nuanced approach at all levels within the communities in which we work.

[152] Forum · LAND AND WATER REVISITED: FILM PREMIER EVENT

Land and Water Revisited is a remake of William T. Sanders's landmark 1962 documentary Land and Water: An Ecological Study of the Teotihuacán Valley of México. The original film provides an invaluable snapshot of agricultural and land-use practices in the area just prior to the urban explosion of Mexico City. Sanders documented farmers using splash irrigation, women washing clothes at a nearby spring, as well as pulque production. Cultural conservation was not the intention of the original film, but it is a sobering reminder of how quickly traditional landscapes and cultural adaptations vanish when sustainability is ignored. The new film highlights the overwhelming number of environmental challenges in the valley and the stories of adaptation as told by the local inhabitants. It is the story of the people of the Teotihuacan Valley and their relationship to their changing environment. In many ways this is a cultural salvage project, as many of the people who have vivid memories of the 1950–1960s are now in their seventies and eighties. This forum consists of (1) an airing of the 28-minute original film from 1962; (2) the one-hour premiere of Land and Water Revisited; and (3) an 80-minute discussion and Q&A with eight panelists.

[153] Forum · TO THE ACADEMY AND BEYOND: A BIOARCHAEOLOGY EMPLOYMENT FORUM

Over the last few years, the Society for American Archaeology has hosted forums related to the pursuit of academic and industry jobs in archaeology. These forums have been informative, but they have not been designed for bioarchaeologists. This forum specifically addresses the concerns of bioarchaeology students and early career professionals and academics. Attendees will better understand options within academia, industry, museum work, and other alt-academic positions. The forum is comprised of early career professional bioarchaeologists, both in and outside of academia, who have recently obtained their current positions. While the forum will have a question/answer focus, panelists will briefly discuss their job market experiences and offer advice related to topics such as sharing knowledge about where and how to find job opportunities outside of academia, useful listservs, using social media to find opportunities, how to tailor materials for applications, what to (not) do in phone/Skype/campus interviews, how to respond to diversity questions, how to receive constructive feedback, etc. Before the meeting, organizers will circulate an informal questionnaire e-mail to their professional networks asking about the issues people wish they were able to address before and during the job search process. Responses will be used to guide the panel discussion.

[154] Forum · SO, YOU HAVE TO MOVE OUT OF YOUR PARENTS' BASEMENT AND GET A JOB!

The profession is changing. More students are graduating, but traditional academic positions are becoming fewer and more competitive. So where are the jobs and what does the future look like? Most archaeologists today are employed in CRM, but even that field is changing as there is an increasing need not only for trained generalists but also specialists. This session is aimed at and for those who have recently received their degree or are about to graduate. The purpose is for professionals to discuss where the jobs are today and where they will be in the future—and the skills needed now and in the future to land a job and keep it.

[155] Lightning Rounds · MULTISCALAR APPROACHES TO EXTRAPOLATING SOCIOPOLITICAL BOUNDARIES IN THE MAYA LOWLANDS

Since the development of settlement archaeology over 70 years ago, archaeologists have attempted to model ancient social and political boundaries from large-scale, regional boundaries between political centers to small-scale, intrasite communities of practice and neighborhoods. While many studies have extrapolated social boundaries using methods such as gravity models, Thiessen polygons, agent-based modeling, social network analysis, nearest neighbor analysis, and least cost paths, few studies have compared the results of the same methods within a single spatial and temporal region. This lightning round focuses on identifying multiscale boundaries in the Classic period (AD 250–800) Maya region using two methods: Kernel Density and Xtent. Kernel Density provides a more “bottom-up” perspective as it incorporates spatial data relating to the number of and density of households, while the Xtent model provides a more “top-down” perspective as it projects a territory of area of control based on the volume or size of a center. Results of these two methods are presented from projects, with extensive settlement surveys and comparable datasets, across the Maya region demonstrating how these methods impact our interpretations across varied landscapes. Our understanding of boundaries impacts our perceptions and interpretations of the ancient Maya, making our discussion of boundary epistemology imperative.

[156] Symposium · STRUCTURE AND MEANING OF MOGOLLON COMMUNAL SPACES AND PLACES IN THE GREATER AMERICAN SOUTHWEST, PART 2: GILA AND HIGHLANDS

The ancient Mogollon people of southern New Mexico and east-central Arizona had rich spiritual and ritual lives based on the presence of communal-type structures dating from the Early Pithouse period through the AD 1400s. The best known are the large “great kivas” at Pithouse period villages, but we know from decades of research that the Mogollon used a wide variety of communal-type structures ranging from extra-large pueblo rooms to plazas. With more recent work, we are beginning to better understand not just structural space represented by communal architecture but other kinds of ritual spaces, such as shrines, trails, and roads for example, and how they articulate with the larger community and the landscapes surrounding them. Using insights gained from broader perspectives on Mogollon communal spaces and places, we are in a better position to understand cultural, social, and ritual meaning associated with them. This symposium brings together the latest research on Mogollon communal and ritual spaces and places and will be of interest not only to American Southwest researchers but to all who have an interest in ritual behavior and action of ancient peoples.

[157] Symposium · VOLCANIC HAZARDS AND HUMAN RESILIENCE IN LATIN AMERICA

From Mexico to Chile, peoples across Latin America settled along a series of volcanic ranges associated with the circum-Pacific "Ring of Fire." Life "under the shadow" of volcanoes exposed inhabitants to frequent risk of eruptions and earthquakes. Yet occupations in these volatile areas often spanned considerable time depth. This interdisciplinary session aims to evaluate how prehispanic peoples adapted to life in volcanically active zones. Guiding questions include: What types of volcanic hazards were experienced by Latin American peoples throughout history? How did they respond? What references to volcanic phenomena can be found in art and ritual practices? Are there modifications to domestic life and agricultural land use that suggest adaptive responses to volcanism? Why did peoples impacted by volcanic eruptions return to affected areas? Do cultural similarities exist among peoples occupying volcanically active zones that crosscut traditionally-defined culture areas? Perhaps most importantly, can archaeological models of volcanic hazards and human responses be helpful for contemporary populations occupying volcanically active zones?

[158] Symposium · THE PRECLASSIC LANDSCAPE IN THE MOPAN VALLEY, BELIZE

Recent research in the Mopan River valley, Belize, has documented a robust Preclassic occupation. Evidence suggests that this region was first settled during the Archaic period and was continually inhabited through the Terminal Classic period. E Groups represent the earliest public/ritual architecture. A formal ceremonial center with an E Group, large platforms, and plazas was present at Early Xunantunich by the Middle Preclassic. The E Group at Las Ruinas de Arenal was also founded during this time. E Groups became more widespread by the beginning of the Late Preclassic as seen at Actuncan, Tunchilen, and Chan. Throughout the Preclassic, there is an expansion of settlement and evidence of formal ritual circuits including hilltop shrines and specialized ritual architecture in hinterland zones. The papers in this session present current research on the Preclassic period from several different archaeological projects. Although each paper presents a unique empirical dataset, the combined research demonstrates that through construction and ritual activities, the Preclassic Maya of the Mopan valley shaped and inscribed a sacred and political landscape. The social memory of these religious and political activities endured for centuries, laying the foundation for their Classic period successors.

[159] General Session · HISTORIC ARCHAEOLOGY IN EUROPE AND THE MEDITERRANEAN**[160] General Session · PUBLIC AND COMMUNITY ARCHAEOLOGY****[161] Symposium · ARCHAEOLOGY IN THE XINGU RIVER BASIN: LONG-TERM HISTORIES, CURRENT THREATS, AND FUTURE PERSPECTIVES**

This session brings together researchers working in different portions of the Xingu River basin, a primary tributary of the Amazon. Recent archaeological and anthropological research reveal a complex and diverse cultural and environmental history extending from late Pleistocene to contemporary indigenous, maroon (quilombola), and riverine (ribeirinhos) occupations. The session focuses on core areas of the basin, the "Xingu corridor," which forms one of the largest protected areas of tropical biocultural diversity in the world. It highlights how indigenous and traditional communities and practices have created complex anthropogenic landscapes over the millennia and have significant implications for conservation and sustainability in the region today. Current pressures include a spike in deforestation in the southern Amazon's "arc of deforestation," which threatens local communities, biodiversity, and the functional integrity of regional ecosystems. The session considers the Xingu basin as a meso-scale area of analysis in Amazonia, a level of analysis generally lacking from regional studies, which tend to focus on minimal sampling in small plots or macroscopic remote sensing analyses to the expense of in-depth contextualized studies. Such in-depth studies, by necessity conducted in partnership with local communities, are precisely what is needed for archaeology to be relevant cultural heritage rights and sustainability.

[162] General Session · ADVANCES IN PALEOLITHIC ARCHAEOLOGY**[163] Symposium · MULTIDISCIPLINARY INVESTIGATIONS IN THE MIRADOR BASIN, GUATEMALA: NEW INSIGHTS INTO THE ORIGINS AND DYNAMICS OF INCIPIENT MAYA CIVILIZATION**

(SPONSORED BY FOUNDATION FOR ANTHROPOLOGICAL RESEARCH & ENVIRONMENTAL STUDIES (FARES))

Multidisciplinary investigations in the Mirador Basin of northern Guatemala have provided a new perspective of the origins and dynamics of incipient Maya civilization, including data on settlement patterns, sampling strategies, demographic distributions, chronological evaluations, DNA and isotope analyses, geological studies, architectural formats, and formation of complex political, social, and economic structures. Incorporation of extensive lidar data combined with archaeological investigations at numerous sites on a regional basis have provided evidence of the process and formation of a complex state by the Middle Preclassic period (ca. 1000–400 BC), with an apogee during the early Late Preclassic period (ca. 300 BC). The transformations into state-level formations suggest that the initial impetus was due to agricultural intensification and population logistics that formed the need for administrative centralization and the formation of government, which, when combined with competitive ideologies and peer-polity interactions, allowed increasing sociopolitical complexity. The cultural and environmental sagas in the Basin had a lasting and profound impact on subsequent Maya social and economic structure and historical trajectories, and provide new theoretical and methodological avenues of research and can further elucidate Maya social process.

[164] General Session · ICONOGRAPHY AND EPIGRAPHY IN THE AMERICAS

[165] General Session • HISTORIC ARCHAEOLOGY IN THE SOUTHWEST UNITED STATES AND MESOAMERICA**[166] Symposium • DANCING THROUGH ICONOGRAPHIC CORPORA: A SYMPOSIUM IN HONOR OF F. KENT REILLY III**

F. Kent Reilly III is a founding member of the Mississippian Iconography Workshop who has worked tirelessly to organize these yearly symposia that are often held at the University of Texas at San Marcos. This also entailed convincing and cajoling Mississippian archaeologists with diverse perspectives into attending these conferences and working together. Additionally, Kent has been an extremely productive scholar who has published on various topics related to Olmec, Mississippian, and historic Native American iconographic motifs, themes, and beliefs. His iconographic analyses of prehistoric symbols from Mesoamerica and the Southeastern U.S. have inspired several generations of students, colleagues, and other archaeologists. He has served, as well, as a mentor and advisor who has shepherded students into archaeology and onward into a variety of professional positions. In this symposium, we offer iconographic analyses in Kent's honor inspired by his work and approach to the prehistoric symbols. Some of the topics that have guided his research include how prehistoric iconographic imagery relate to various ceremonies, dances, cults, bundles, cosmologies, and deities, as well as their relationship to the development/expression of power and difference. These topics serve as guideposts for the archaeologists participating in this symposium and our forays into iconographic imagery.

[167] Symposium • THE BETHEL CEMETERY RELOCATION PROJECT: HISTORICAL, OSTEOLOGICAL, AND MATERIAL CULTURE ANALYSES OF A NINETEENTH-CENTURY INDIANA CEMETERY

Due to unavoidable redevelopment and facility expansion, the Indianapolis Airport Authority (IAA) contracted with the cultural resource management specialists of Cardno to conduct public coordination, background research, field documentation, geophysical investigation, excavation, and ultimately relocation of individuals buried in the Bethel Cemetery (12MA1025), located in Decatur Township, Marion County, Indiana. This once rural cemetery, likely established in 1827, was utilized by early Indiana settlers and their descendants until 1935. In the summer of 2018, 543 burials, only 135 of which were marked with extant headstones, were removed by Cardno in collaboration with faculty and students from Indiana University-Purdue University (IUPUI), University of Indianapolis (UIndy), and Indiana State University (ISU). Subsequent osteological and material culture analyses were conducted prior to reburial at a new cemetery in August 2019. The new cemetery location was rededicated September 2019. This symposium presents ongoing research related to this excavation and associated lab analyses. Specific paper topics include project background information, Bethel Cemetery's history, photogrammetry and imaging of the cemetery landscape and individual burials, bioarchaeological investigation of the human remains including demography and paleopathology, kinship and spatial patterning of burials, above- and below-ground material culture analyses, and collaborations with the living descendant community.

[168] Symposium • ANCIENT MESOAMERICAN EXCHANGE SYSTEMS AND ECONOMY: BUILDING ON THE WORK OF RONALD BISHOP, PART 2

Application of neutron activation analysis (NAA) to archaeological materials started in the 1960s. Yet it was in the 1970s that INAA really took off when the field recognized its great potential for study of exchange systems and economies. That occurred in large part due to the influence of an early adopter in archaeology, Ronald L. Bishop. With his unique background, Bishop coupled a chemist's understanding of the technique with an archaeologist's and anthropologist's understanding of what constituted an important problem. He also recognized that meaningful interpretation of precise chemical and mineralogical characterizations of ceramics required understanding the ceramic studies of collaborating archaeologists and the full culture-historical context of samples. Over four+ decades, Bishop and his collaborators have brought hard data to the study of material-exchange systems across Mesoamerica, from the southern periphery in Nicaragua to the northern periphery in the U.S. Southwest. His contributions to understanding Maya economic systems have been particularly numerous and influential. To recognize his work and build on it, a number of Bishop's current and past collaborators will report new results, evaluate interpretations, or synthesize studies that employ NAA or other characterization techniques to advance the study of Mesoamerican economies. Second of two sessions.

[169] General Session • BIOARCHAEOLOGY, MORTUARY ANALYSIS, AND ANCIENT DNA**[170] Symposium • NO STONE UNTURNED: A SYMPOSIUM IN HONOR OF MICHAEL B. COLLINS**

Dr. Michael Collins's long and distinguished career began in high school when he founded the Midland County Archeological Society in Texas. Since then he has made an indelible contribution to archaeology. His research, both in and out of the field, has always been at the forefront of archaeological inquiry as well as representing his passion for embracing new technological methods. His work at the Gault Archaeological Site perhaps best exemplifies his lifelong commitment and dedication to archaeological research that emphasizes outreach and education. The papers in this session celebrate Dr. Collins's contributions to Texas prehistory, Clovis technology, and of course his pursuit for answers in the peopling of the Americas.

[171] Symposium • RISKIER BUSINESS, PART 2: COMPARATIVE APPROACHES TO RISK AND RESILIENCE IN DRYLAND ENVIRONMENTS

Part 2: Drylands currently make up 47% of the earth's surface and host 39% of the world's population. Recent climate models predict that by the end of this century, 20%–30% of the planet will be significantly drier. As our planet experiences more rapid global warming, arid landscapes become increasingly widespread. Such landscapes can no longer be considered marginal and/or inimical to human lifeways. Instead, drylands should continue to be at the forefront of research agendas, as landscapes simultaneously of risk, vulnerability, resilience, and potential. These are not homogeneous landscapes, but complex and diverse ecosystems that interact with each other as well as their inhabitants. Archaeology gives us a long-term perspective on how past societies managed risk under arid and aridifying conditions in the past. Such long-term perspectives on human-environment interactions are crucial to evaluate the scope and trajectory of ongoing climatic and environmental changes and sustainable responses. The goal of this

session is to explore current approaches to risk and resilience in arid landscapes rooted in the perspectives and methods of environmental archaeology. Additionally, this session invites consideration of how this research can be better applied to contemporary problems posed by aridification in different parts of the world.

[172] Symposium - NAVIGATING ETHICAL AND LEGAL QUANDARIES IN MODERN ARCHAEOLOGICAL CURATION
(SPONSORED BY COMMITTEE ON MUSEUMS, COLLECTIONS, AND CURATION)

Archaeological repositories and museums contend with legal and ethical concerns on a daily basis. While the laws and regulations surrounding archaeology have been significantly modified over the past few decades, those applying to archaeological curation facilities, museums, and repositories have remained largely stagnant and impractically vague. Each facility is attempting to deal with concerns such as accepting unprovenienced collections, valuing donated collections for tax write-offs, and property/intellectual property issues concerning digitization and open-access projects, to name a few. We are finding that while there are some great resources out there and some laws that have been more recently created or amended, in the end, we are mostly all operating by means of agreed consensus without recourse to solid, modern regulations or laws. This symposium creates a forum for archaeological curators to discuss (with discretion) some of the specific instances that they have faced recently, how they attempted to resolve them, the challenges they have encountered, and what, if any, resolutions have been found. As a result of this forum, we hope to identify some key common issues that we are facing nationwide, and help jump-start the impetus to update or develop much-needed nationwide standards and regulations.

[173] Symposium - INCREASING THE ACCESSIBILITY OF ANCIENT DNA WITHIN ARCHAEOLOGY

Building upon last year's session that examined how ancient DNA research can best support the goals of archaeology, we focus this year's session on how ancient DNA research and the data it generates can be made more accessible to archaeologists, and why this is essential for the future of archaeogenetics. The field of ancient DNA continues along a trajectory of rapid growth, with many studies now analyzing tens or hundreds of individuals from previously unexplored regions of the world or periods of time. This trend emphasizes the need for an increase in the quantity and quality of communication between archaeologists and geneticists surrounding the standards and guidelines used to develop research agendas as well as the analytical methods used and interpretations made in studies of the past. The papers in this session provide examples of integrative archaeogenetics projects, present methodological developments that have enabled such projects, and otherwise discuss and explore the symbiotic relationship between archaeology and genetics. By increasing the transparency of our research and taking further steps toward a common language understood by researchers from these different, but complementary, disciplines, the papers in this session contribute to the overarching goal of furthering active dialogue between archaeologists and geneticists.

[174] Symposium - PEERING INTO THE NIGHT: TRANSITION, SOCIOPOLITICAL ORGANIZATION, AND ECONOMIC DYNAMICS AFTER THE DUSK OF CHAVÍN IN THE NORTH CENTRAL ANDES

Historically regarded as the hallmark of the Early Horizon, traces of Chavín influence have been observed throughout the Central Andes. However, the Chavín Interaction Sphere spanned both regionally and temporally: echoes and consequences of Chavín influence reverberate in subsequent cultural traditions. During and after this dusk of Chavín, it is clear many parts of the Central Andes were going through states of transformation or reformation. This session synthesizes recent work addressing the period after Chavín and leading up to the Early Intermediate Period; 500/400 to 200/50 BCE. While these general trends do exist, it is apparent the immediate post-Chavín Central Andean landscape otherwise shows substantial regional variability. General trends from this time period emerge, such as the proliferation of fortifications and widespread social violence; emergence and consolidation of social hierarchies; metallurgy as a craft beyond gold; changes in food patterns, especially on the Pacific coast; and extensive interzonal trade and exchange networks. Papers tease apart potential commonalities and differences observed during this time period, while deliberating on the causes and consequences of the patterns observed in this transitional period with implications for preceding, contemporary, and/or future traditions—contributing to broader anthropological and historical theories exploring transitions, “collapse,” and “moments between.”

[175] General Session - ARTIFICIAL INTELLIGENCE, DRONES, LIDAR, AND MACHINE LEARNING: NOVEL APPROACHES TO ARCHAEOLOGICAL DATA COLLECTION AND ANALYSIS

[176] Poster Session - THE ARCHAIC PERIOD IN EASTERN NORTH AMERICA

[177] Poster Session - ARCHAEOLOGY OF THE ARCHAIC PERIOD

[178] Poster Session - THE CLASSIC PERIOD IN THE MAYA LOWLANDS

[179] Poster Session - HUNTER-GATHERERS POPULATION DYNAMICS, DIET, AND MOBILITY ON CENTRAL AND COASTAL TEXAS LANDSCAPES

Central and Coastal Texas has a long 13,000-year record of hunter-gatherer occupation and use. During this expansive time period, Central and Coastal Texas foragers experienced not only regular seasonal changes but several longer stages of fluctuating moisture and temperature shifts. For example, after 3000 BP the Gulf Coastal sea levels stabilized and there are major changes in hunter-gatherer socio-ecological interactions, diet, and demographics. There is an increased appearance of large mortuary sites after sea-level stabilization and evidence for territoriality, intensification on localized resources, and landscape partitioning. This

symposium highlights these and other changes revealed by ongoing investigations of these issues spanning the time period from the Early Archaic (7500 BP) to the end of the Late Prehistoric (300 BP).

[180] Poster Session • CONVERSATIONS ON HUNTER-GATHERER BEHAVIOR AND LIFEWAYS

Research on hunter-gatherer archaeology is published at a rapid rate, and we often do not have a chance to integrate findings between different regions, time periods, or specialties. There are few opportunities to discuss the ramifications of research, or simply present a preliminary idea or impression, before advancing toward writing and publication. This session is meant to bring together hunter-gatherer archaeologists at a variety of research stages—from the seed of an idea to a nearly finished product—who seek outside input and discussion. This poster session will be participatory and will invite critique and active engagement from conference attendees. In particular, we hope to begin conversations with archaeologists who study regions and time periods different from our own to help expand the significance and impact of our own research.

[181] Forum • LAND AND WATER REVISITED: PANEL DISCUSSION

Land and Water Revisited is a remake of William T. Sanders's landmark 1962 documentary Land and Water: An Ecological Study of the Teotihuacán Valley of México. The original film provides an invaluable snapshot of agricultural and land-use practices in the area just prior to the urban explosion of Mexico City. Sanders documented farmers using splash irrigation, women washing clothes at a nearby spring, as well as pulque production. Cultural conservation was not the intention of the original film, but it is a sobering reminder of how quickly traditional landscapes and cultural adaptations vanish when sustainability is ignored. The new film highlights the overwhelming number of environmental challenges in the valley and the stories of adaptation as told by the local inhabitants. It is the story of the people of the Teotihuacan Valley and their relationship to their changing environment. In many ways this is a cultural salvage project, as many of the people who have vivid memories of the 1950–1960s are now in their seventies and eighties. This forum consists of (1) an airing of the 28-minute original film from 1962; (2) the one-hour premiere of Land and Water Revisited; and (3) an 80-minute discussion and Q&A with eight panelists.

[182] General Session • ARCHAEOLOGY OF THE ANDES: FORMATIVE, EARLY HORIZON, EARLY INTERMEDIATE PERIOD

[183] Electronic Symposium • DIGITAL ARCHAEOLOGICAL METHODS IN THE COMMERCIAL SECTOR

(SPONSORED BY DIGITAL DATA INTEREST GROUP)

For commercial archaeologists, the process of completing compliance-oriented work has long included the management of archaeological data. As information technologies continue to develop, we find ourselves increasingly incorporating digital methods into our workflows. In keeping with oft-cited policies of doing “more with less,” these are not just translations of extant processes. Instead, these are often both an expansion of the amount and types of data we use. This electronic symposium is intended to explore where digital methods have been used within the commercial sector and identify lessons learned. The goal is to begin discussion and identification of best practices for digital methods within the private sector of cultural resource management, with the particular aim of increasing communication between different regions. What digital methods are we adopting? What are the challenges of adopting those methods?

[184] Poster Session • ARCHAEOLOGY AND ITS STAKEHOLDERS

[185] Poster Session • CONSERVATION AND CURATION

[186] Poster Session • CULTURAL RESOURCE MANAGEMENT

[187] Poster Session • THE VETERANS CURATION PROGRAM: A CELEBRATION OF DR. MICHAEL “SONNY” TRIMBLE

The Veterans Curation Program (VCP) was started by Dr. Michael “Sonny” Trimble in 2009 and is administered by the U.S. Army Corps of Engineers St. Louis District's Mandatory Center of Expertise for the Curation and Management of Archeological Collections. The program hires veterans who served during Operation Iraqi Freedom (Iraq) and Operation Enduring Freedom (Afghanistan) to rehabilitate archaeological collections and also provides the veterans with support for personal growth and development. Since its inception, the program has grown to include seven VCP laboratories, through which over 400 archaeological investigations are being or have been rehabilitated. These include both stand-alone contractor administered flagship labs as well as satellite labs embedded at several universities. To date, the program has trained and employed more than 600 veterans and over 90% of the program participants have found permanent employment or returned to school. This poster symposium celebrates the legacy of Dr. Trimble by showcasing some of the work and research of the VCP.

[188] Poster Session • APPLYING THE POWER OF PARTNERSHIPS TO THE SEARCH FOR AMERICA'S MISSING IN ACTION

The Defense POW/MIA Accounting Agency's mission is to provide the fullest possible accounting for our missing personnel from past conflicts to their families and the nation. We search for missing personnel from World War II, the Korean War, the Vietnam War, the Cold War, the Gulf Wars, and other recent conflicts. Our research and operational missions include coordination with countries and municipalities around the world and also involves a growing number of partner organizations who work closely with the agency. DPAA has initiated and developed its partnerships program over just the past few years. This symposium offers a closer look at the

results by opening a window into the efforts, and perspectives, of a select group of partners themselves. From university departments to cultural resource management firms, from the simple coordination of information sharing to the complexity of launching massive field projects, from the involvement of accomplished scholars to passionate amateurs—the power of partnerships encompasses a great deal. With more than 82,000 Americans still missing, however, we aim here to not only discuss the successes of the initiative but to also foster dialog regarding how partnerships can be a sustainable and effective tool in the context of the accounting effort.

[189] General Session · NEW RESEARCH IN MESOAMERICA

[190] Symposium · ARCHAEOLOGY FOR THE PUBLIC AND BY THE PUBLIC: PAPERS IN HONOR OF DICK BOISVERT

Dr. Richard (Dick) Boisvert recently retired from his position as the New Hampshire State Archaeologist. During his post he published numerous, impactful papers on the Paleoindian period of the Northeast and beyond. However, Boisvert's greatest legacy is in the impact he has had on public archaeology. During his tenure as the head of the State Conservation Rescue Archaeology Program he trained hundreds of avocational archaeologists, advocated for site stewardship, and helped launch the careers of many professionals. This symposium hopes to honor that legacy by discussing current work in public archaeology. The participants are all individuals whose careers have been influenced by Boisvert works, mentorship, and friendship. Papers will focus on current work in cultural resource management, heritage research, and working with the public.

[191] Symposium · SCULPTURE OF THE ANCIENT MEXICAN GULF COAST, PART 1

The ancient cultures along the Gulf Coast of Mexico produced some of the most significant sculptural traditions of Mesoamerica. The types of sculptures range from colossal heads, figurative statues, carved and plain stelae, large-scale terracotta sculptures, relief-carved ball court panels to yokes, hachas, and palmas decorated with intricate entrelaces. Although some traditions have received a lot of scholarly attention, others have not—and few studies have attempted to understand the relationships of these diverse sculptural traditions over time and space. The cultural-historical approach to the region has led to its conceptual segmentation as well as of its artistic developments, resulting in an oversimplified cultural and by extension sculptural sequence that proceeds from south to north: the Preclassic Olmec in the south, Classic Veracruz along the central Gulf Coast, and the Postclassic Huastec culture in the north. In this session, archaeologists and art historians working in the Mexican Gulf lowlands will examine sculpture relative to issues such as interregional and intraregional connections, continuity and disjunction, cross-media relationships, and hieroglyphic inscriptions. Participants will consider social memory, reuse, and ritual destruction, as well as the visual references in cultural dispersal, with an eye toward creating a new synthesis of ancient Gulf Coast sculpture.

[192] General Session · HISTORIC ARCHAEOLOGY WORLDWIDE

[193] Symposium · "IS THERE GOLD IN THAT FIELD?" CRM AND PUBLIC OUTREACH ON THE FRONT LINES

(SPONSORED BY PUBLIC ARCHAEOLOGY INTEREST GROUP)

Public outreach and education is often seen as the responsibility of universities, government organizations, and state run systems. The first archaeologist many people meet, however, is more likely to be working in cultural resource management. Interactions may range from the informal, like chatting with curious members of the public who have stopped by a field project, to extremely formal such as public outreach projects arranged as part of a creative memorandum of agreement for a Phase III Investigation. CRM is an industry driver for archaeology, where unique contributions to the field are regularly made, but it is not always possible for the general public to easily access the results of these investigations. Almost 90% of archaeological work conducted in the United States happens through CRM, and this session will delve into successful public engagement projects conducted in the commercial sector.

[194] General Session · ARCHAEOLOGY OF THE ARCHAIC PERIOD

[195] Symposium · FAR WEST PALEOINDIAN ARCHAEOLOGY: PAPERS FROM THE NEXT GENERATION

Over the last decade, Paleoindian research in the Far West has become integral to the discussion of the peopling of the Americas. Recent research at potential pre-Clovis-aged sites such as the Paisley Caves, Oregon, and Cooper's Ferry, Idaho, have ignited fierce debates, spawned novel theories, and inspired new researchers to join the field of Paleoindian archaeology. This symposium explores the future of Far West Paleoindian archaeology by focusing on the research of current and recent graduate students from various universities. These papers examine old ideas and present new questions, methods, and discoveries in topics such as colonization, settlement/subsistence, and technological organization. The goal of this symposium is to foster new ideas and to develop bonds between the next generation of Far West Paleoindian researchers so that we may continue and build upon the legacy of our predecessors.

[196] Symposium · POTTERS IN PASTURES NEW: MOBILITY, CONTACT, AND CERAMIC TECHNOLOGICAL CHANGE

Recent analytical studies of archaeological pottery have moved beyond establishing the regularity with which vessels moved over long distance, highlighting the mobility of ceramic technologies and potters themselves. Ceramic petrography, in particular, has provided insights that combine provenance determination with detailed reconstructions of technological practice. Once dominated by evolutionary narratives based on the unidirectional transfer of knowledge, studies of culture contact now acknowledge the complexity of colonialism, understand that the ascription to human groups of artifact style and technical traits is problematic, and

realize that technological transfer affects the colonist as much as the indigenous populations. The concept of hybridity seems only to essentialize original typological or technological classifications, themselves abstractions of past realities. Instead, we need to acknowledge how pottery technologies change, how new techniques are adopted or rejected, and the ways in which potters make sense of new environments and available resources. This session brings together analytical studies of ceramics from the Mediterranean and the Americas. The emphasis is on the reconstruction of ceramic practice, technologies transformed in contact situations, how potters make sense of new environments, their choice of raw materials, and the interplay between handmade and rotary forming traditions, as well as their techniques of firing.

[197] General Session • ARCHITECTURE IN THE AMERICAS

[198] General Session • PALEOINDIAN AND PALEOAMERICAN ARCHAEOLOGY

[199] General Session • NEOLITHIC ARCHAEOLOGY

[200] Symposium • NAVIGATING IMPERIALISM: NEGOTIATED COMMUNITIES AND LANDSCAPES OF THE INKA PROVINCES

The Inka frequently manipulated terrain and moved populations to meet imperial demands and legitimize their power. As a result, the Inka impacted native landscapes, often by forming colonies across their empire. This involved various social, political, and economic negotiations that led to the manifestation of imperial installations (such as state roads, administrative centers, and terracing systems) and spaces of local resistance. This symposium explores how local communities and landscapes responded to Inka imperialism. The session compares imperial and local strategies across different communities and provinces throughout the empire.

[201] Symposium • PROYECTO ARQUEOLÓGICO COCHASQUÍ-MOJANDA: RECENT RESEARCH DEVELOPMENTS AT HIGHLAND ECUADOR'S MONUMENTAL CENTER

Cochasquí lies in the northern Ecuadorian highlands at an elevation of approximately 3,000 m on the southern slope of the extinct Mojanda volcano. The site commands an impressive view of the Interandean Valley and some of its most majestic volcanoes. Cochasquí (ca. AD 950–1550) is one of the most important archaeological sites in Ecuador. The people of Cochasquí built some of the largest pyramids in the Andes and famously resisted the Inka conquest for some years, yet surprisingly little is known about the site or its occupants. Nonetheless, the site occupies a revered status in the national narrative. Even today, Cochasquí serves as a symbol of Ecuadorian national legitimacy and power with newly elected officials symbolically granted the mantle of their office in a ceremony conducted atop one of the pyramids. But what changes led to development of a site like Cochasquí? Who were its occupants, how did they live, and how was their society structured? And what ultimately led to the site's abandonment and disuse? This symposium is a review of recent research developments of our project, Proyecto Arqueológico Cochasquí-Mojanda.

[202] General Session • REMOTE SENSING AND GEOPHYSICS

[203] General Session • OBSIDIAN AND PXRF STUDIES

[204] General Session • ETHNOGRAPHY AND ETHNOARCHAEOLOGY: WORLDWIDE PERSPECTIVES

[205] General Session • BRONZE AGE ARCHAEOLOGY

[206] Symposium • LIDAR FROM EARTH TO SKY AND BACK IN THE MAYA LOWLANDS, PART 1

This session will focus on 250 km² area of lidar data acquired in 2016 over the Programme for Belize and the Blue Creek projects. The papers in this session will be a summary of the ongoing research efforts in northwestern Belize. The authors focus on a range of scales and contexts, including monumental structures and public plazas, households, communities, and broader regions. We include technical lidar papers and ground verification studies used to map archaeological features, including those from urban, water, and agriculture chronosequences. We also include environmental archaeology studies that focus on archaeology from ecological, geological, and geophysical perspectives. The combined datasets and results will shed light on the ancient practices of management of local resources and general human impact on the landscape.

**[207] Forum • INCREASING GLOBAL COLLABORATION BETWEEN THE SAA AND EAA
(SPONSORED BY SAA PRESIDENT)**

The EAA and the SAA initiated discussions on extending collaboration at the 2019 EAA meeting in Bern, Switzerland. This forum is a follow-up to that session. Participants will discuss additional ideas concerning continual globalization of the archaeological enterprise in terms of contemporary issues to which archaeology can provide useable answers. These discussions will serve to provide an impetus for further examination of contemporary issues that archaeologists in the SAA and the EAA encounter.

[208] Forum · ANCIENT HISTORY? SHARED EXPERIENCES IN CHEROKEE ARCHAEOLOGY CHALLENGE THE COMMON CONCEPTION OF "COLLABORATION" BETWEEN ARCHAEOLOGY AND NATIVE AMERICAN TRIBAL NATIONS

Modern professional ethics advocate for collaboration between archaeology and affected communities. How archaeology programs, individual archaeologists, Native American nations, and descendant communities are to implement and overcome this historically engrained discontinuity, however, is still ill-defined. This lack of definition results in little to no presence in the way of current archaeology curricula. This panel explores what successful strategies look like through the lens of Cherokee archaeology. Panel members representing the Eastern Band of Cherokee Indians, tribal archaeologists, academics, and nonnative archaeologists working within Cherokee traditional territory discuss what works and doesn't work when fostering a culture of integration over mere collaboration.

[209] Forum · ARCHAEOLOGY IN IMPERILED COMMUNITIES AND LANDSCAPES OF GUATEMALA: CHALLENGES AND POTENTIAL PATHWAYS FORWARD

This forum unites intersecting themes relating to crises in archaeological practice in Guatemala today. Our political reality in the United States is increasingly hostile to our Central American neighbors. This year, 18 of our research team members departed for "El Norte." Those remaining told me about loved ones who'd left with only a vague sense of what might await them. Those seeking opportunities in the United States do so for a variety of complex reasons. Nevertheless, the effects of climate change and global economic forces will further compromise opportunities. Though we are not trained in how to collaborate effectively in terms of political and community engagement, our success depends on our ability to do more than hire local workmen. We must perceive needs on the ground to maintain successful equilibrium between research demands and the needs of surrounding communities and environments. Some of us work in protected areas, some in semi-rural communities, others in urban zones. We all work on the past in the present. We discuss common challenges and avenues for humanitarian-centered research in Guatemala today.

[210] Symposium · COERCION, VIOLENCE, AND INEQUALITY IN ARCHAEOLOGICAL PERSPECTIVE

Archaeologists have become increasingly interested in assessing the causes and dynamics of social and wealth inequality in the past. This new focus of research has in part been driven by the growing mass of social science scholarship which orbits around the work of Thomas Piketty and colleagues associated with the World Inequality Database. Piketty has shown convincingly that in a modern capitalist system conditions of exaggerated inequality usually result from gradual, generally peaceful processes of resource accumulation due to changes in the relative valuations accruing to labor and capital over time. This vision of how inequality arises is at odds with the argument of historians including Charles Tilly and Ian Morris: that structural social and economic inequalities in the premodern past usually resulted directly from coercive violence or its threat. In this symposium, we discuss what the archaeological evidence from prehistoric societies might add to our understanding of the variety of peaceful and violent dynamics that lead to inequality in human societies. Scholars in the session will weigh the likely importance of coercion as a prominent force in shaping, causing, or maintaining archaeologically apparent disparities in personal well-being and access to resources in a range of spatial and historical contexts.

[211] General Session · RITUAL AND SYMBOLISM IN ARCHAEOLOGY

[212] Poster Session · HISTORIC ARCHAEOLOGY AROUND THE WORLD

[213] Poster Session · HISTORIC ARCHAEOLOGY IN EASTERN NORTH AMERICA

[214] Poster Session · HISTORIC ARCHAEOLOGY IN WESTERN NORTH AMERICA

[215] Poster Session · NSF REU SITE: EXPLORING GLOBALIZATION THROUGH ARCHAEOLOGY 2019–2020 SESSION, ST. EUSTATIUS, DUTCH CARIBBEAN

The goal of the National Science Foundation (NSF) Research Experiences for Undergraduates (REU) Exploring Globalization through Archaeology site is to introduce students to scientific research through the archaeological and bioarchaeological investigation of a variety of seventeenth- to nineteenth-century sites on the Dutch Caribbean island of St. Eustatius (Statia). During the eighteenth century, Statia was one of the most important ports in the world where different communities involved in global trade responded in different ways. This project explores how individuals and communities reacted and adapted to the rise of capitalism and globalization on Statia. The 2019 investigations included archaeological excavations and visualizations of a sugar plantation (SE095) industrial sugar processing complex, continued bioarchaeological studies of an eroding unmarked cemetery (SE600), and geophysical surveys of a slave village, Leper asylum, and several eighteenth-century cemeteries. Posters in this symposium highlight the breadth of research being conducted by students, project staff, and project mentors that expand our understanding of how globalization affected different communities on Statia.

**[216] Symposium · RECENT RESEARCH IN AFRICAN ARCHAEOLOGY
(SPONSORED BY SAFA - SOCIETY OF AFRICANIST ARCHAEOLOGISTS)**

This symposium presents new and ongoing research on the archaeology of Africa. Presenters use a broad range of methodological techniques and cover contexts from throughout the continent. The scale of analysis ranges from highly focused (study of an individual artifact or a minute examination of a single house) to expansive (broad regional surveys). In light of ongoing dialogues about sexual harassment, assault, and disparities of power in archaeological fieldwork and training, several papers in this session

emphasize issues of gender and/or sex in their analyses or use a feminist theoretical approach. This session will provide a venue to discuss new findings and approaches as they relate to the archaeology of Africa.

[217] Forum · SAA TASK FORCE ON SHARING PUBLIC OUTCOMES OF CRM: FINDINGS AND PROCESSES TO FACILITATE DATA SHARING BETWEEN RESEARCHERS AND AGENCIES

(SPONSORED BY TASK FORCE ON SHARING PUBLIC OUTCOMES OF CRM)

In 2018, the Board of Directors of the Society for American Archaeology (SAA) chartered a task force on "Sharing Public Outcomes of CRM." The task force was charged with "providing draft guidelines with regard to the conditions under which site data including site location could be shared for legitimate research purposes." The task force included representation and input from SAA interest groups for Digital Data, Open Science, and Quantitative Methods, also archaeological big data projects, various state and federal agencies, tribal archaeology, cultural resource management, and public archaeology. Suggestions for the SAA include concrete steps to strengthen advocacy for data management roles within agencies, institutional commitments to advise data sharing between researchers and agencies, and to disseminate a "Framework for Archaeological Research-Agency Data Coordination Processes." This framework entails a nonprescriptive, 10-point plan for researchers and agencies to communicate needs and develop shared goals regarding secure reuse of sensitive archaeological data. The framework is modeled on the advisory functions and beneficence goals of institutional review boards and the SAA Principles for Archaeological Ethics that should help all parties involved better understand their individual and collective responsibilities in conditions where comprehensive archaeological site data are shared.

[218] Forum · MANAGEMENT AND SECURITY OF DIGITAL DATA FOR SENSITIVE COLLECTIONS

Collections-holding institutions tasked with the curation of human remains and other sensitive materials face a multitude of concerns surrounding security and care of these collections. The increasing popularity of data digitization holds great benefit not only to collections but also to the various communities who may require and request access to this information. Yet, the growth in data produced through digitization practices also results in serious security concerns. Collections that fall under NAGPRA in particular necessitate well-thought-out data management and security, but the format of data made publicly accessible through national NAGPRA can be difficult to navigate and digest. With funding from a 2016 IMLS grant, members of Repatriation, Anthropology Collections, and Information Technology at the Field Museum are collaborating to ensure the standardization and security of sensitive collection data. Aspects of this data are also pulled into a developing website which will present basic information regarding sensitive collections, particularly human remains, to the public in a (hopefully) more user-friendly and informative format. In this session, Field Museum staff will discuss concerns of digital data management and public access and ways in which the museum has collaboratively approached these challenges for its ongoing project. Audience participation will be encouraged.

[219] Forum · TEACHING AND TRAINING IN GEOARCHAEOLOGY: PEDAGOGICAL METHODS AND CURRICULAR PATHWAYS

(SPONSORED BY GEOARCHAEOLOGY INTEREST GROUP)

This forum brings together those who have developed methods for teaching geoarchaeology and/or have trained students the field. We encourage participants to share innovative teaching methods and/or to share the best pathways to prepare new researchers in geoarchaeology. We invite examples from all pedagogical formats (lab, field, lecture, seminar, travel, or online). Although we seek a focus on undergraduate learners, we do expect discussion on teaching and training aspects in graduate school. Aspects of training new practitioners of geoarchaeology are also welcome to the discussion, particularly focusing on the diversity of students who want to pursue a career in geoarchaeology and target jobs in the field. Discussants and audience members are given 5–10 minutes to present an idea with up to 5 minutes of question and discussion from the forum. We encourage visual aids where appropriate.

[220] Forum · "THE OLD THAT'S WORTH SAVING": HOW CAN WE PRIORITIZE WHEN WE CAN'T SAVE THEM ALL?

Climate change affects archaeological sites at an ever-growing rate. There is neither enough funding nor enough excavators to dig our way out of the problem, while repositories are also underfunded and understaffed. When limited resources are available, ideally they are used for the maximum benefit of all stakeholders. This requires a broadly applicable transparent prioritization scheme. It must be usable within particular sets of constraints, like governmental agency missions or funding sources with restricted geographical or temporal interests.

Several prioritization schema exist. Most are intended to deal with resources already determined to be important (World Heritage sites, National Parks, etc.). Challenges include ways to deal with sites of unknown potential, and to better balance the interests of all stakeholders, including under-represented groups. This forum is envisioned as a way to move the discussion forward. A companion CCSAR-sponsored poster session (Beyond Triage: Prioritizing Responses to Climate Change Impacts on Archaeological Resources) will provide information on various approaches to prioritization, which we hope can form the basis for a broader discussion.

[221] General Session · CULTURAL HERITAGE AND PRESERVATION

[222] General Session · PREHISTORY OF THE SOUTHEASTERN UNITED STATES

[223] Symposium · NEW LIGHT ON DZIBANCHÉ AND ON THE RISE OF THE SNAKE KINGDOM'S HEGEMONY IN THE MAYA LOWLANDS

Since 1995, the Kaanul (Snake) kingdom has been known as one of the most influential states in Classic Maya history. According to epigraphic evidence, its kings acted as overlords over most of the southern and central Maya Lowlands' kingdoms. The notion that a vast hegemony compassing much of the lowlands has since subverted prior assumptions on the complexity and scale of Classic

Maya states. However, many questions remain regarding the place of origin of the Kaanul kingdom and the processes that led to its rise as a hegemonic state, as well as a nuanced understanding of the nature of the hegemony. The location of its capital had long been a subject of debate, first erroneously identified with La Corona, Guatemala, then, correctly, with Calakmul, Campeche. Later finds leave little doubt that before Calakmul, the site of Dzibanche, Quintana Roo, was an earlier capital of the Kaanul kingdom. Here we present currently available archaeological, lidar, and epigraphic data recovered from Dzibanché and affiliated lowland sites with updated interpretations on the early history of the Kaanul kingdom and on the urbanistic features of the center of a hegemonic Classic Maya state.

[224] Symposium · NAVIGATING IMPERIALISM: NEGOTIATED COMMUNITIES AND LANDSCAPES OF THE INKA PROVINCES, PART 2

The Inka frequently manipulated terrain and moved populations to meet imperial demands and legitimize their power. As a result, the Inka impacted native landscapes, often by forming colonies across their empire. This involved various social, political, and economic negotiations that led to the manifestation of imperial installations (such as state roads, administrative centers, and terracing systems) and spaces of local resistance. This symposium explores how local communities and landscapes responded to Inka imperialism. The session compares imperial and local strategies across different communities and provinces throughout the empire.

[225] Symposium · NEW PERSPECTIVES ON RITUAL VIOLENCE AND RELATED HUMAN BODY TREATMENTS IN ANCIENT MESOAMERICA

Ancient Mesoamericans deemed ritual violence a crucial form of merit-making with the divine. Until recently, humans themselves were considered supreme “food staples.” Their bodies were to vitalize the cosmos at the pulse of consecrated time intervals. Victims were prepared and sacrificed in prescribed ways to liberate their animate essences, believed to be harbored mainly in a person’s heart and blood. Past death, the sanctified fleshly remnants would sometimes be processed and exhibited as trophies or relics. Although ritualized violence is abundantly recorded in Maya iconography and has been inferred from simultaneous multiple interments and deposits of articulated body segments, only the last two decades of scholarship have seen methodological and interpretive strides toward a more nuanced exploration of sacrificial practices. This session examines old and new graphic, archaeological, and forensic evidence across the Mesoamerican landscapes to discuss choreographies, occasions, and ceremonial devices related to ritual violence and associated body processing. Interpretative and methodological caveats are addressed in the way.

[226] Symposium · TEACHING THE ANTHROPOCENE

As modern societies come to grips with the impacts of a changing planet, students are seeking answers to questions about our past and the history of human activity that has led to the development of the Anthropocene. In the context of traditional World Prehistory courses, the focus remains on the sequence of cultural and technological development, with the co-evolutionary aspects of the Anthropocene relegated to later discussion. We advocate teaching the Anthropocene—not the modern effects of climate change, but the history and trajectory of change as revealed through archaeological inquiry. How can a course in archaeology provide students with a perspective on the history of human decision-making that has created the world around us? What materials and cases are relevant to understanding the development of the Anthropocene, and how can we as educators modify courses to focus on particular outcomes that are relevant to modern problems? What kinds of learning objectives, assignments, and assessments offer content and feedback to students that can help engage them with modern issues—both in terms of preserving the planet, understanding the past, and protecting critical resources? What should be our goals, as educators and archaeologists, in the face of a looming climatic crisis?

[227] Symposium · SCULPTURE OF THE ANCIENT MEXICAN GULF COAST, PART 2

The ancient cultures along the Gulf Coast of Mexico produced some of the most significant sculptural traditions of Mesoamerica. The types of sculptures range from colossal heads, figurative statues, carved and plain stelae, large-scale terracotta sculptures, relief-carved ball court panels to yokes, hachas, and palmas decorated with intricate entrelaces. Although some traditions have received a lot of scholarly attention, others have not—and few studies have attempted to understand the relationships of these diverse sculptural traditions over time and space. The cultural-historical approach to the region has led to its conceptual segmentation as well as of its artistic developments, resulting in an oversimplified cultural and by extension sculptural sequence that proceeds from south to north: the Preclassic Olmec in the south, Classic Veracruz along the central Gulf Coast, and the Postclassic Huastec culture in the north. In this session, archaeologists and art historians working in the Mexican Gulf lowlands will examine sculpture relative to issues such as interregional and intraregional connections, continuity and disjunction, cross-media relationships, and hieroglyphic inscriptions. Participants will consider social memory, reuse, and ritual destruction, as well as the visual references in cultural dispersal, with an eye towards creating a new synthesis of ancient Gulf Coast sculpture.

[228] General Session · PERSPECTIVES ON EDUCATION, PEDAGOGY, AND ACCESSIBILITY

[229] General Session · SOUTHWESTERN ARCHAEOLOGY: ANCESTRAL PUEBLO, MOGOLLON, AND HOHOKAM

[230] Symposium · LIDAR FROM EARTH TO SKY AND BACK IN THE MAYA LOWLANDS, PART 2

This special session will focus on the ~250 km² area of lidar acquired in 2016 over the Programme for Belize and the Blue Creek Region as well as nearby projects areas. These areas have vast Maya infrastructure and this survey and others have found vast

amounts more. We include technical lidar papers, ground verification studies, and studies that used lidar to map archaeological features, including those from chronosequences of urban, water, and agriculture. We also include environmental archaeology studies that focus on archaeology in ecological, geological, geophysical, and soils studies.

[231] General Session · CULTURAL RESOURCES AND HERITAGE MANAGEMENT: RESEARCH FROM AROUND THE WORLD

[232] General Session · NEW RESEARCH IN LITHIC ANALYSIS

[233] General Session · SUBSISTENCE AND FOODWAYS IN THE AMERICAS

[234] General Session · ARCHAEOLOGY OF THE IRON AGE

[235] General Session · NEW RESEARCH IN PALEOETHNOBOTANY

[236] General Session · LITHIC AND MATERIALS ANALYSIS IN WESTERN NORTH AMERICA

[237] Symposium · KEEPING IT REAL: PAPERS ON EVIDENCE-BASED ARCHAEOLOGY TO HONOR HECTOR NEFF

Archaeological knowledge depends on generating testable propositions about the past and then generating data that bear on the validity of those propositions. Hector Neff is not unique in adopting this as a guiding principle of his work, but he has been clear and consistent in applying it. From his investigation of the origins and technology of Mesoamerican Plumbate pottery undertaken over 40 years of his career, to chemistry-based provenance studies in many other world regions, to applications of remote sensing, to efforts to document human impacts on the southern Mesoamerican landscape, he has endeavored to bring the past to life with statements about it that have strong empirical support. While he has advocated an evolutionary perspective, he has also insisted that theoretical exercises be backed up by honest efforts to test the hypotheses derived from evolutionary theory. Looking at his whole body of work, we believe Neff's consistent adherence to an empirical standard has made a significant impact on description and explanation of the archaeological record. To honor this contribution, we present papers in this symposium in which we seek to generate testable hypotheses about the past and to bring new field-archaeological and/or analytical data to bear on them.

[238] Symposium · ADVANCES IN GLOBAL SUBMERGED PALEOLANDSCAPES RESEARCH

(SPONSORED BY ISLAND AND COASTAL ARCHAEOLOGY INTEREST GROUP)

Worldwide, there has been an increase in research focused on submerged paleolandscapes as a way to better understand these spaces within a cultural framework and with the intention of identifying evidence of human activity on these once subaerial places. This research tends to be interdisciplinary and technologically advanced and focuses on a wide range of methods to understand sometimes vast regions. We are interested in highlighting this research to the broader archaeological community in part to bring awareness to this maritime research and to bring together a community of scientists from across the globe that can share experiences and help to advance the discipline of maritime archaeological research.

[239] General Session · COLONIAL AND CONTACT PERIOD ARCHAEOLOGY

[240] Poster Session · WORLDWIDE ADVANCES IN BIOARCHAEOLOGY AND MORTUARY ANALYSIS

[241] Poster Session · FOODWAYS

[242] Poster Session · ANDEAN ARCHAEOLOGY: LATE INTERMEDIATE, LATE HORIZON, COLONIAL

[243] Poster Session · ANDEAN ARCHAEOLOGY: FORMATIVE, EARLY HORIZON, MIDDLE HORIZON

[244] Poster Session · ANCIENT DNA AND MOLECULAR ARCHAEOLOGY

[245] Poster Session · USING ACTUALISTIC EXPERIMENTS IN RANGE CREEK CANYON, UTAH: THE NEXT STEPS

Since 2013, staff and students of the Range Creek Field Station (RCFS), eastern Utah, have been studying Fremont farming techniques by conducting actualistic farming experiments. These experiments are designed to understand the costs and benefits of irrigating and storing maize under modern environmental constraints. By farming small plots of maize at the RCFS, we are able to build expectations about what past farmers would have done. One experiment looks at the productivity of maize (yield) depending

on amount of water given to each plot. A second experiment measures the costs of irrigation by constructing a simple surface irrigation system using only simple tools available 1,000 years ago to Fremont farmers. A third experiment records the rooting depth of maize plants watered at varying depth. A fourth experiment measures the costs and benefits of constructing small replica storage structures used by the Fremont. The posters in this session will discuss the results of these experiments and how the results inform on the archaeology of Range Creek Canyon and other desert farmers. The topics include actualistic experiments, excavation of historic ditches, changes in rooting depth of heirloom maize varieties, and variability in maize starch when watered different amounts during the growing season.

[246] Symposium - CHALLENGES AND FUTURE DIRECTIONS IN THE ARCHAEOLOGY OF THE SIERRA NEVADA DE SANTA MARTA (COLOMBIA)

The webs of archaeological information on the mountain range of the Sierra Nevada de Santa Marta (Northern Colombia) during prehispanic and early colonial times have to be built patiently. Few Spanish chroniclers have talked about it, the colonial period left researchers with very few archives, and grave-looting has been endemic and intense. It is thought there is a plethora of archaeological materiality with incipient context. All presentations in this session will try to untangle ways of materializing the abstraction that is a research subject: of particular techniques, trade routes (within the Sierra Nevada de Santa Marta or outside), and their consequent landscape shaping. Human/environment interactions, as well as ecology politics and technology politics will be at the core of the problematics developed. Drawing on a variety of archaeological methods and borrowing from an array of disciplines, our goal is to understand the Sierra Nevada de Santa Marta both as an isolated mountain and a highly interconnected space, in hope of bringing alive its complex layers and modals of interaction among its actors.

[247] Symposium - CELEBRATING DIVERSITY IN DOWNTOWN REDLANDS, CALIFORNIA: STORIES OF CHINATOWN AND THE BARRIO

In 2019, Statistical Research Inc. (SRI) completed a historical period data recovery project in Redlands, San Bernardino County, California. The investigation focused on nineteenth- and twentieth-century deposits related to the community's former Chinatown, a Mexican barrio, and nearby commercial and industrial establishments. The project research design focuses on the changing cultural geography of Redlands, and the roles of residential populations that are underrepresented in written documentation. The research contributes importantly to studies of Chinese transnationalism and the connections between several southern California Chinatowns. The project area produced over 700 intact features and a plenitude of associated artifacts—ample data to address important topics such as land use, socioeconomics, private and public ethnic expression, and the nature of ethnic interactions. The material culture represents domestic activities, industrial pursuits, and the dynamics of an evolving community. Project tasks included amassing and synthesizing archival materials, artifact analysis, dialogue with descendant groups, and commemorative efforts in public venues. The project presented a rare opportunity to elucidate the historical narrative, to demonstrate the willingness of the City of Redlands to document an unpleasant part of its past, and the enthusiasm of the client, ESRI, to recognize the value of this historic preservation effort.

[248] General Session - MUSEUMS, COLLECTIONS, AND REPATRIATION

[249] Symposium - INDIAN OCEAN SOCIOPOLITICAL AND ECONOMIC CONNECTIONS AS REVEALED BY THE STUDY OF ANCIENT AND HISTORIC GLASS PRODUCTION AND TRADE

Exploring materials traded and exchanged in networks within the Indian Ocean interaction sphere are of paramount importance to understanding the scale and extent of these connections through time and space. Glass and glass beads dating back to the first millennium BC moved through these early and later networks. Continued improvements on analytical techniques and new archaeological excavations and research have increased our knowledge of glass/glass bead recipes, and production, trade, and consumption locations, which in turn have led to a better understanding of trade within the Indian Ocean. However, the rise and fall of sociopolitical states within this region resulted in a continuously shifting and adapting structure of networks connecting the different actors of the trade. By studying the glass industry and especially glass trade in the greater Indian Ocean, researchers can examine how such industries responded to changing trade patterns from around the mid-first millennium BCE to the late medieval period. This session presents new and revised information on trade of Indian Ocean glass/glass beads and how examining their production and movement can be used as a proxy for better understanding socioeconomic connections and the rise and fall of political powers and exchange networks within and beyond this region.

[250] Symposium - ARCHAEOLOGY IN MOZAMBIQUE: CURRENT ISSUES AND TOPICS IN ARCHAEOLOGY AND HERITAGE MANAGEMENT

Mozambique is a country that boasts a unique diversity in archaeological heritage and history. Given its location in East Africa, many cultural horizons present in the region can be found in archaeological sites across the country. From Early Stone Age rock shelters and open-air sites in regions throughout Mozambique to the Swahili Coast ruins in the north, not to mention the historical sites related to Portuguese colonialism and slavery, the cultural-historical landscape offers a vast array of important themes for further research. With this diversity in cultural heritage, and a growing interest in various research topics, the importance of the protection and conservation of this archaeological material—both land and sea—has become a pressing matter. This session is organized as a broad overview of current research topics within the growing field of Mozambican archaeology. The aim is not only to demonstrate the wide breath of topics in the field, but also to identify common themes in both current and future research, while also identifying threats to Mozambican heritage. Our goal is to produce a working consensus regarding lingering issues and questions for archaeologists working in Mozambique.

[251] Symposium • DEEP HISTORY, COLONIAL NARRATIVES, AND DECOLONIZATION IN THE NATIVE CHESAPEAKE

This session considers efforts to write archaeological accounts of Native societies in the Chesapeake region that span the divide between deep history and the colonial era. Archaeological studies aiming to bring the region's precolonial past into conversation with colonial histories face tensions stemming from divergent research questions, writing styles, temporal frames, and interpretive touchstones. Moving beyond these tensions—theoretically, methodologically, and writerly—is critical if archaeologists are to contribute to efforts to decolonize narratives of indigenous pasts.

[252] General Session • COASTAL AND ISLAND ARCHAEOLOGY**[253] Symposium • LITHIC RAW MATERIALS, TOOLS, AND TECHNOLOGICAL ORGANIZATION: PAPERS IN HONOR OF WILLIAM ANDREFSKY JR.**

This symposium honors the career of Dr. William Andrefsky Jr. and his scholarly contributions to the studies of lithic technological organization and stone tools. Andrefsky worked on four major initiatives in his career including the Washington State University (WSU) Museum's NAGPRA-compliant U.S. Army Corps of Engineers collections; research on the origins of sedentary aboriginal lifeways in the southern Columbia Plateau; inventory of Colorado's Purgatoire River; and research along the Owyhee River in collaboration with the Bureau of Land Management and WSU, generating multiple graduate student theses and publications. Through these projects, his early work in Alaska and the Upper Delaware Valley, and recent experimental and geochemical studies, he honed his skills as a flintknapper, methodologist, and researcher. He has written and contributed to numerous volumes on lithic analysis and interpretation, many of which have influenced archaeological investigations worldwide. In this symposium, former students and colleagues cover a broad range of topics inspired by Andrefsky, including stone tool and debitage analysis, raw material sourcing, and experimental archaeology.

[254] Symposium • BROADER IMPACTS AND TEACHING: ENGAGING WITH DIVERSE AUDIENCES

(SPONSORED BY TEACHING ARCHAEOLOGY INTEREST GROUP AND PUBLIC EDUCATION COMMITTEE)

Archaeology education reaches beyond the classroom, into the public sphere, and affects diverse audiences. To make archaeology relevant today, we must connect with students, members of the public, and policy-makers. These audiences bring a variety of backgrounds and perspectives. To have a greater impact on diverse audiences, we must take their lived experiences, knowledge, and interests into account and broaden our teaching methods. This symposium discusses various experiences, case studies, and best practices for reaching diverse audiences.

[255] Symposium • UP IN FLAMES: ASSESSING ALAN SULLIVAN'S QUEST FOR AN INDEPENDENT ARCHAEOLOGY

Archaeology is often thought of as the handmaiden of cultural anthropology—related but dependent. For more than 40 years, Alan Sullivan has sought to establish the independence of archaeology and in so doing has shaped the way many archaeologists think about this relationship. In the spirit of the late David Clarke, Sullivan articulated a body of distinctly archaeological theory linking the archaeological record to our inferences about the past. His focus on traces of human activity in artifacts, features, surfaces and deposits drew our attention to the dynamic nature of the archaeological record as well as toward the breadth of information that could be preserved (or modified or lost) along the way. This emphasis on identifying trace formation processes, assembling relevant evidence to adjudicate equifinality, and the independence of inference construction from ethnographic analogy has guided his contributions to novel understandings of ceramic production, settlement dynamics, and human ecology in the Southwest United States. As many of his conclusions challenge conventional wisdoms, his work is not without controversy. In this session, his colleagues and former students consider Sullivan's contributions to archaeological theory, Southwest archaeology, and human ecodynamics.

[256] Symposium • U.S. ARMY CORPS OF ENGINEERS: PUBLIC OUTREACH AND ENGAGEMENT AND ALTERNATIVE MITIGATION

The U.S. Army Corps of Engineers (Corps) is one of the nation's oldest federal agencies. The Corps has multiple missions, including construction of harbors, navigation improvements, erosion and flood risk management, military construction, permitting of work in waters of the United States, and cleanup of environmental contamination in the United States and abroad. Due to the diversity of its missions and regional specificities, there is an equally diverse amount of work conducted by Corps archaeologists and cultural resource managers, including working with multiple stakeholders, ranging from private individuals to federally recognized tribes to state and federal agencies. This session explores public outreach and engagement for archaeology conducted by the Corps and alternative mitigation involving public outreach and engagement.

[257] Symposium • RECENT INNOVATIONS IN ECUADORIAN ARCHAEOLOGY

The archaeology of the Northern Andes was originally defined by grand schemes and theories. Beginning with the work of Jijón y Caamaño and Uhle and continuing up to Meggers, Evans, and Estrada, archaeologists focused on extra-regional influences on cultural origins and ceramic typologies. In more recent years, and especially with the onset of cultural resource management in Ecuador, new approaches have led to innovative results with perspectives that differ from earlier approaches. Our understanding of the societies that lived in the Northern Andes is explored in order to establish a greater knowledge of prehistoric Ecuador that includes community development, ideology, economy, and the chronology of culture change. This symposium brings together some of the recent advances in Northern Andean archaeology.

[258] Symposium • PLANT EXUDATES AND OTHER BINDERS, ADHESIVES, AND COATINGS IN THE AMERICAS

Plant exudates are a chemically diverse class of materials that includes resins, gums, kinos, rubber, latex, lacquer, balsams and amber. These materials appear in the archaeological, anthropological, botanical and historical records worldwide as adhesives, binders, and coatings, molded and sculpted forms, and as substances used for ceremonial, medicinal and food. For this session, we extend the range of materials under consideration to include insect lac, tars and bituminous materials. Despite widespread use and numerous applications (both utilitarian and ceremonial), there has been much less research on the characterization and use of plant exudates in the material culture of the Americas than in Europe and Asia. This session is focused on exudates in material culture, including studies on identification, chemical fingerprinting, botanical and geographic sourcing, experimental archaeology, processing, and trade/exchange. Contributions from several disciplines are included.

[259] Symposium • SLAVERY IN THE AMERICAS: ARCHAEOLOGY AND ARCHIVES

This session examines theoretical and methodological approaches to studying the history of slavery in the Americas. While the value of archival resources to the study of enslaved populations is clear, so are the tensions between the material and archival records and the biases and lacunae in written histories with regard to marginalized peoples. The papers in this session will explore the complex relationships between archaeological and archival records, present new methods and resources relevant to archaeological and archival research, and/or critically examine the complex relationships between archival and archaeological records. Topics to be highlighted include human-animal relationships, indigenous peoples and institutions of slavery, slavery in urban and rural environments, records of enslaved people and free people of color, the identification and protection of slave burials, and ongoing efforts to digitize archives related to slavery. Geographical contexts include Peru (pre- and postcontact), Mississippi, Kentucky, Georgia, and North Carolina.

[260] Symposium • NEW PERSPECTIVES ON THE LATE INTERMEDIATE PERIOD IN SOUTHERN PERU

The Late Intermediate Period in southern Peru is traditionally characterized as a period of increasing regionalism and violence. Recent research, however, has begun to explore the manner in which interregional interaction and exchange remained persistent during this time period despite the collapse of the larger Wari and Tiwanaku polities who controlled this region during the Middle Horizon. In the Moquegua Valley, for example, there is evidence for the ethnogenesis of multiple groups with distinct ceramic styles who shared cemeteries and exchanged materials between the coast and the highlands. In this symposium, we present new research on the Late Intermediate Period of southern Peru that reveals the persistence of multiregional interaction with multiple lines of archaeological and bioarchaeological evidence.

[261] Symposium • THE WORLDS OF ISLAMIC ARCHAEOLOGY: INVESTIGATION, INTERPRETATION, AND INNOVATION

This session seeks to bring together Islamic archaeologists to discuss current approaches and questions on a variety of research in the field. By addressing a large range of topics and work, we aim not only to connect scholars working in seemingly disparate geographical areas and periods but also to deepen our perception of the nature of Islamic archaeology and its potential for future research. We welcome papers that approach any aspect of Islamic archaeology from a variety of perspectives and methodologies.

[262] Symposium • AN OCEAN OF DATA: OPPORTUNITIES AND CHALLENGES FOR USING LEGACY DATA IN PACIFIC ISLAND ARCHAEOLOGY

This session highlights the opportunities and challenges associated with using legacy data to advance new research and manage archaeological and cultural resources in the Pacific Islands. More than a century of previous research in the region has produced foundational knowledge on a broad range of topics and generated a wealth of data through the survey, mapping, excavation, and analysis of cultural material as well as through collecting oral histories. These legacy datasets provide opportunities for the continued study of a number of research areas. They also present several challenges such as locating repositories of artifacts and records, resolving questions of quality, and making data available for reuse. We invite presenters to discuss how the application of digital technologies are being used to transform analog legacy data to digital format, as well as how legacy data fits with contemporary data that are born digital.

[263] General Session • DISCOVERIES IN BRONZE AGE ARCHAEOLOGY**[264] General Session • PREHISTORY OF THE MIDWESTERN UNITED STATES****[265] Symposium • THE PRACTICE OF MAYA WARFARE**

Warfare as a process profoundly impacts the human experience. The fortification of settlements in many parts of the world defined ancient notions of cities, culture, and wilderness (Ballmer et al. 2018; Tracy 2000). Additionally, the creation of martial landscapes and maintenance of warriors can define communities and provide a means for social differentiation, which includes the perpetuation of social hierarchies (Earle 1997; Tilly 1985). This session foregrounds a focus on the concrete dynamics and lived experience of war in the Maya cultural context. The aim is to shift away from treating war as an abstract category and think about social conflict at the level of practice (e.g., Inomata 2014; Nielsen and Walker 2009). How did Maya peoples prepare for and engage in combat, as well as administer the outcomes of war? What can be said about strategy, operations, and tactics in the past? How did the Maya use weapons, armor, and fortifications? With these questions in mind, the presenters in this session provide richly contextualized case studies and overviews of warfare from across the Maya area that demonstrate the broad impacts of social conflict.

[266] Symposium • MUSIC ARCHAEOLOGY IN THE TWENTY-FIRST CENTURY: EXPLORING CONCEPTUALIZATIONS OF "MUSIC" AND RELATING METHODOLOGIES TO MATERIAL AND HUMAN CONTEXTS

Invoking the term "music" in archaeology triggers epistemological questions: the conceptual and practical tools that we use to engage musical concerns determine (1) how we define what is musical, (2) what forms of archaeological evidence we explore, and (3) the methodologies we develop and leverage in response to these experientially implicative themes, within specific archaeological contexts. For example, whether and how acoustical methodologies are employed for music archaeological research previously distinguished music archaeology from archaeoacoustics, which arose as separate fields but have become practically synonymous in anthropological archaeological applications, although not in all discourse. Music making, a cultural practice, is both contextually dependent and contextually generative. Therefore, the inferential strategies used in music archaeological research are particularly sensitive to anachronistic and cross-cultural biases, although music archaeology must somehow reflect material culture. The case-study and philosophical discussions in this session, focused in the Americas, present a variety of archaeological approaches to musical concerns, relating methodological frameworks to archaeological materials, research contexts, and human experience.

[267] General Session • THE ARCHAEOLOGY OF TRADE AND EXCHANGE

[268] Symposium • IN THE FOOTSTEPS OF TORIBIO MEJÍA XESSPE: THE CORRAL REDONDO ARCHAEOLOGICAL PROJECT, PERU

Corral Redondo is located in southern Peru, where the Churunga River joins the Ocoña River on its way from the Andes to the Pacific Ocean. In 1943, the site briefly shot to fame after local villagers recovered here spectacular artifacts from the Middle and Late Horizon periods. The type and number of artifacts found suggests that this functioned as a ceremonial compound in both Wari and Inka times. However, because the site was looted and the finds dispersed to museums in Peru and elsewhere, all archaeological information associated with them has been lost. In the summers of 2018 and 2019, a team of scholars and students from the Institute for Field Research, University of Chicago, the Cotsen Institute, Indiana State University, and local archaeologists visited the Ocoña Valley to investigate and record the site of Corral Redondo and its wider environs. In this session, the first results of this ongoing research endeavor will be discussed, focusing not only on the excavation of Corral Redondo but also on the survey and mapping of sites in the surrounding valleys, as well as on community-based collaboration with the local school and conservation of the artifacts kept at the local museum.

[269] General Session • LANDSCAPE ARCHAEOLOGY IN THE AMERICAS

[270] General Session • ZOOARCHAEOLOGY AND FAUNAL ANALYSIS

[271] Symposium • INTERSECTIONS OF AQUATIC ECOSYSTEMS AND HUMAN SOCIETY

The influence of aquatic environments on human societies is profound, both past and present, affecting settlement strategies, subsistence, and social relations. Likewise, humans influence these ecosystems in ways that can be measured and have far-reaching consequences for both understanding the past and in preparing for the future. Investigations in coastal, riverine, lacustrine, estuarine, and wetland environments offer both immense data potential, and unique challenges that require efforts to foster greater interaction between scholars working in very different contexts, and disciplines. To encourage dialogue and collaboration, papers from a range of methodologies, contexts, and perspectives will be offered, with a focus on human relationships with aquatic ecosystems and resources.

[272] Symposium • MATERIALIZING POLITICAL ECOLOGY: LANDSCAPE, POWER, AND INEQUALITY

Archaeology is well suited to highlight the active qualities of materials with its focus on material culture such as artifacts and building features, as well as environmental elements of landscapes such as plant remains and soil. However, the ways people relate to landscapes and materials cannot be separated from power relationships, and the papers in this session embrace materiality without ignoring unequal relations between people. This session brings together scholars working in different areas around the world who reinsert the political into approaches that take seriously the active qualities of materials and landscapes. The materials that we explore embody the social, political, and environmental dimensions of landscapes. The papers in this session consider how the relationships between inequality, power, and ecology are materialized in landscape at multiple scales, from households to settlement. Papers range in global, social, and material context, demonstrating the wider applicability of combining materiality, landscapes, and political ecology to our discipline.

[273] Symposium • TO MOVE FORWARD WE MUST LOOK BACK: THE SLAVE WRECKS PROJECT AT 10 YEARS

The Slave Wrecks Project (SWP) is a collaboration between the Smithsonian National Museum of African American History and Culture, the National Park Service, Diving With a Purpose, Iziko Museums of South Africa, Eduardo Mondlane University, the Society of Black Archaeologists, the University of the Virgin Islands, and other community partners that combines research and underwater and community-focused terrestrial archaeology with public engagement activities. These engagement activities include educational and training programs, museum exhibits, professional internships, and archival research. The SWP fosters public and scholarly understanding of the role of the African slave trade in shaping global history by using maritime and terrestrial archaeology as the vehicle for examining enslavement and its far-reaching global impacts, and the central role that this process played in constituting the modern world. Since 2010, our field efforts have been conducted both along the shores and under the waves in South Africa, Mozambique, Miami, FL (Biscayne National Park), and St. Croix, U.S. Virgin Islands. This symposium presents the results of SWP efforts to foster this understanding, engage local communities in uncovering and preserving their histories, and train local youth to build capacity in heritage management.

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.

Participants-Individual Abstracts

Abdolahzadeh, Aylar (University of Pennsylvania), Dennis Sandgathe (Simon Fraser University), Deborah Olszewski (University of Pennsylvania) and Shannon McPherron (Max Planck Institute for Evolutionary Anthropology)

[36]

Does the Southwest France Pattern of Neanderthal Fire Use Exist across Europe?

Less frequent use of fire during cold periods and greater use during warmer periods has been observed as a pattern in several Middle Paleolithic sites in southwestern France. This calls into question the consistency of fire use among Neanderthals who lived in the mid-latitudes of the European continent. In recent years, the majority of research related to this subject is primarily from evidence for the presence and absence of direct fire residues (charcoal and ash). However, relying on direct evidence of fire is problematic due to preservation bias. The present research overcomes this problem, to some extent, by analyzing stone artifacts. This poster presents the results of a study on the percentage of burned flints in several lithic assemblages (only cave and rock-shelter sites) selected from a wide range of geographic and climatic conditions during the Late Pleistocene within the European continent in order to (a) understand whether this pattern can be also observed across Europe in the Late Pleistocene, and (b) to evaluate the variability in the frequency of fire use in the archaeological record.

Abdullayev, Rahman (Gobustan National Historical Artistic Preserve) and Vugar Isayev (Gobustan National Historical Artistic Preserve)

[111]

Scientific Research at Gobustan National Historical Artistic Preserve and International Collaboration

Discovered at 1939 by archaeologist Ishag Jafarzade scientific investigations in Gobustan National Historical Artistic preserve are continues. Despite the lack of technology and international experience archaeological investigations held during the USSR period led light to many questions about Gobustan petroglyphs. Because of the political and socio-economic condition after the collapse of USSR scientific researches at Gobustan was stopped. In relation to the inscription into the UNESCO World Heritage List during the last fifteen years, there are several scientific projects held at Gobustan and examples took the international experience gained randomly. Gobustan National Historical Artistic preserve into the collaboration with an international network of rock art organizations, like "European Rock Art Trails" of Council of Europe in order to gain high standards of management of rock art sites. But there is an urgent need of experience or partners especially in the field of conservation of petroglyphs.

Abell-Selby, Emma

[214]

Compliance v. Deviance within the U.S. Army (1890–1950)

Using Giddens' agency theory, this research explores self-care and institutional care practices in the U.S. Army. This project examines medical and personal care items discarded by U.S. soldiers from Bldg. 104 of the San Francisco Presidio from 1890 to 1950. These artifacts were found in a barrack and include items such as bottles (e.g., alcohol, medicine, soda), razors, toothpaste, floss, chewing gum, health-related advertisements and pamphlets, cigarette packaging, Kellogg's Corn flakes, etc. Methods include cataloging and analyzing artifacts, conducting archival research at the Golden Gate National Recreation Area, as well as examining primary and secondary source documents. This research investigates whether or not soldiers complied with or deviated from the rules and expectations of the U.S. Army. Fundamentally, the U.S. Army provided soldiers with structure, safety, and purpose. Prior to 1890, health and preventative medicine were becoming of great interest to the U.S. Army because of the outbreak of cholera in the 1850s. In order to ensure the health and wellbeing of the troops, the U.S. Army took great lengths to educate military personnel on the dangers of illicit sexual activity and consumption of alcohol. The items discarded in Bldg. 104 also represent quotidian life within the U.S. Army.

Ables, Dayna (Bureau of Land Management - New Mexico State Office)

[88]

Discussant

Abraham, Shinu (St. Lawrence University), Laure Dussubieux (Field Museum), Thomas Fenn (University of Oklahoma) and Alok Kanungo (Indian Institute of Technology Gandhinagar)

[249]

Reconstructing Glass Manufacturing Patterns in India through Raw Materials Sourcing and Ethnoarchaeological Investigations

Despite the widespread distribution of Indian-made glass beads around the Indian Ocean and beyond, not much is known about South Asia's early glass industries from the first centuries BCE through the second millennium CE. This paper will present an overview of an ongoing project designed to use elemental and isotopic characterizations of soil samples from selected regions around India to connect raw material sources to ancient glass artifacts. One of this survey project's goals is to examine localized production patterns in order to investigate whether glass and bead making may have shifted within India regionally and temporally, in response to changing overseas demand. Another important byproduct of the survey is the recognition of local and regional variability in glass making techniques and organization, through the compilation of ethnographic accounts on these fast disappearing village-based industries.

Abraham, Shinu [249] see Fenn, Thomas

Abramovich, Lucía (San Antonio Museum of Art) and Jennifer Mathews (Trinity University)

[109]

The Nuts and Bolts of Collaboration: The Precolumbian Collection as a Bridge between Curators and Professors

Despite a similar educational trajectory, curators and professors have drastically different experiences and expectations in their respective careers. Moreover, the modern-day reality of these occupations is vastly different from previous generations, and the study of collections has had to adjust accordingly. In this paper, we discuss ways of cultivating the relationship between universities and museums that benefit both institutions and aid curators and professors in meeting their professional goals. More specifically, we survey the historical relationship between the San Antonio Museum of Art (SAMA), as it pertains to SAMA's collection of Pre-Columbian Art, and Trinity University's Department of Sociology and Anthropology. Historically, the SAMA-Trinity partnership has allowed curators to participate in teaching and oversee student projects through internship programs. This assistance facilitates deeper research of museum collections and improves visitor engagement with the museum collection. While archaeology professors may be dissuaded from working with museum collections because of a lack of archaeological context, they may formulate rich class experiences when students conduct original research/and or receive applied professional training in a museum setting. Looking ahead, we consider how this collaboration will evolve in this era of more socially-engaged museums and universities.

[109]

Chair

Abrego, Alejandra [147] see Hertfelder, Paula

Abrego, Alejandra [79] see McGuire, Randall

Acabado, Stephen [239] see Rodning, Christopher

Acebo, Nathan [27] see Tomczyk, Weronika

Aceituno, Javier [198] see Robinson, Mark

Acevedo, Natalia [246] see Weber, Marion

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

[269]

Preclassic Maya Site Engineering and Landscape Evolution: The Role of the Hydraulic and Defensive Earthworks at El Tintal, Petén, Guatemala

During the Late Preclassic period, massive construction projects were carried out at sites across the south-central Yucatán Peninsula, in a region known as the Central Karst Uplands. At sites like El Tintal, El Mirador, Nakbe, Yaxnoca and Calakmul, inhabitants modified the landscape through massive filling and levelling operations prior to constructing large pyramid complexes. Elevated causeways were also laid out radiating out from the site centers, connecting outlying groups and neighboring sites. Additionally, at El Tintal, two major earthworks were completed, consisting of extensively excavated features. The first of these is a canal or moat that encircles the epicenter of the site, which we previously suggested might have had a dual function; while the second, the North Canal, connected Chacamat lagoon with the Nacimiento drainage north of the site. Over a few centuries, El Tintal's inhabitants carried out major engineering works that drastically altered their landscape and would continue to influence successive occupations at the site for over a millennia. We will present a summary of results and analysis based on LIDAR data and recent excavations looking at deliberate and unplanned consequences that these monumental constructions produced on the landscape.

Adam, Manda

[53]

Postclassic Ritual Deposits in Northwest Belize

In northwest Belize there is limited material evidence for the full range of Postclassic Maya occupation and presence. While there is evidence for occupation in the Early Postclassic, the remaining data for the Late Postclassic time period generally consists of ritual visitation deposits. These ritual visitation deposits consist of incensarios at the bases of stela and/or temples and have been found at the sites of Dos Hombres, La Milpa, and Chan Chich, among others. This paper examines and synthesizes these deposits of Postclassic Maya as ritual activity in northwest Belize.

Adam, Manda

[206]

Chair

Adam, Manda [206] see Ruffe, Danielle

Adams, Alisha (University of Otago), Sian Halcrow (University of Otago), Andrew Millard (Durham University), Hoang Trinh Hiep (Vietnamese Institute of Archaeology) and Marc Oxenham (Australian National University)
[199]

The Crossover Conundrum: Exploring the Relationship between Linear Enamel Hypoplasia and Incremental Dentine Isotopes in Prehistoric Vietnam

Early life stress can have life-long consequences for health of the individual and population. Within archaeology, infant and childhood physiological stress can be addressed by studying the skeleton, which is a record of diet and stress over the lifetime. However, there is an interwoven, biocultural relationship between diet and stress, and detangling this relationship is difficult using one method alone. To clarify the relationship between diet and stress during development, this research compares the timing of linear enamel hypoplasias (LEH), markers of stress identified through microscopic topographic methods on tooth enamel, and incremental dentine stable isotope profiles, which allow changing diet and stress episodes to be observed. Dentine and enamel grow concurrently, thus combining these methods provides clarity to the interaction of changing diet and stress in children. This paper presents two individual cases from Man Bac in Neolithic Vietnam, investigating the timing of LEH and changes of $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$. These cases illustrate how each method interprets the timing of dietary and stress indicators, based on metric positioning or aging systems. We demonstrate the problems when combining methods, and how to address these issues when discussing developmental stress in the past.

Adams, Aron [229] see Stephens Reed, Lori

Adams, Christopher (Gila National Forest Archaeologist)
[122]

Mimbres Exploitation of Native Copper on the Gila National Forest, New Mexico

The discovery of a native copper artifact on a Classic Mimbres site on the Gila National Forest in southwestern New Mexico in 2009, initiated an archaeological investigation to determine if more native copper artifacts existed in the Mimbres area. This preliminary investigation involved surveying a small sample of Mimbres prehistoric sites using the latest metal sensing technology available, documenting the distribution of native copper nuggets and copper artifacts within the Mimbres area of the Gila National Forest. This poster presentation will highlight the results of the metal sensing survey but more importantly it will focus on the Mimbres exploitation of natural/worked copper nuggets, fragmented/crushed/complete copper bells, copper fetishes and other copper artifacts that have been recently discovered adjacent to Mimbres pithouses and Classic Mimbres pueblo sites dating from AD 950–AD 1130.

Adams, Jake (USDA Forest Service)
[253]

Typological Miscommunication: Can We Get to the Point? A Case Study from Alaska

Artifact typologies are an essential component of archaeological research that facilitate the organization of data into convenient and easily discernible categories. Types are produced through morphological similarities of artifacts and observable patterns that may be used to answer specific research questions. This is particularly the case for projectile points that may manifest in specific styles that include traits such as flake patterns, flutes, and notches. Even though a useful and necessary tool in theory, typologies often fail in practice. If these approaches are opaque and ambiguous, they prove to be more of a detriment than an advantageous tool for discourse concerning artifacts in time and space. In this context, a specific case study of typological miscommunication is examined from the perspective of late Pleistocene/early Holocene Alaska. A picture survey based on projectile points that have been classified into “rigid” categories was undertaken to see how reliable and consistent typological designations are for archaeological research. Alternatives to defining strict cultural traditions, or complexes, are discussed from behavioral and lithic technological organization approaches.

Adams, Jennifer [252] see Perdikaris, Sophia

Adams, Jonathan [161] see Wright, David

Adams, Karen [235] see Turner, Michelle

Adams, Kenneth [198] see Wriston, Teresa

Adams, Megan (Eckerd College)
[197]

Imprints of Landscape Inequality at Bourbon Plantation, Cat Island, Bahamas

Studies of British colonial plantations in The Bahamas have increasingly explored the landscape for manifestations of social inequality. Several models of hierarchical landscape organization have been suggested in the last few decades. A recent mapping survey of Bourbon Plantation, an early nineteenth-century cotton and livestock estate on Cat Island, provides an opportunity to assess these models. The spatial distribution of masonry architectural remains suggests a built environment with a subtle, but consistent, relationship between topographic relief and architectural elaboration. A key architectural feature in this context is vertical height, which correlates strongly with natural elevation. The findings evoke contemporary discourses on viewshed, panopticon, and

other conceptualizations of social visibility. Apart from shedding light on an important local heritage site and a one-time settlement for enslaved laborers, the survey raises questions about the roles of human ecology and hegemonic power in the creation of agrarian landscapes in the colonial West Indies.

Adams, Sophia [135] see Hamilton, Derek

Adeyemo, Elizabeth (University of Notre Dame)

[216]

Investigating Connections: Ecology and Indigenous Resource Utilization among the People of Agbowo Ikosi

The materialization of the perspicuous human niche forms over a substantial period of time. This occurrence births the accumulation of diverse cultural expressions among different groups occupying varying geographical locations. Based on the theoretical background of sociocultural ecology to understand human-environment relationships, this research demonstrates the relationship between the subsistence, architecture and the spatial distribution among the people of Agbowo Ikosi, Lagos state, Nigeria. Using ethnographic tools, this research reveals that the environment significantly stimulates rather than dictates human choices of settlement location, architectural construction and the space allocation of the population. Although fishing is the major means of livelihood in the community, the indigenes have varying architectural structures within the community which are clearly segregated into temporary and permanent structures mainly induced by fishing seasons. The temporary structures are located close to the lagoon and built with thatch sourced from across the lagoon. On the other hand, the architectural structures considered more permanent are built away from the lagoon with clay found in close proximity to the habitation. Although a single community, the differences in the architectural structures, subsistence patterns and the level of specialization reflects human adaptation to the environment, utilizing available resources in a typical traditional society.

Adler, Michael (Southern Methodist University)

[148]

Transfers of Power: Caching of Ritual Objects in Precolonial and Postcolonial Picuris Pueblo

This research considers caching and deposition of ritually-charged objects in pre- and post-colonial Pueblo communities in the Northern Rio Grande region. These depositional acts show continuities in the practices of empowering and constraining the agency of objects over long time spans. The particular focus of this study is a cache of Catholic religious medallions and other items deposited in the walls of the eighteenth-century mission church at Picuris Pueblo and considers various interpretive approaches to the cache by tribal and non-tribal individuals.

Adovasio, J. M. (Senator John Heinz History Center)

[170]

The Gault Site, Mike Collins, and the Prehistory of the America

Collins's still ongoing excavations at the Gault Site (41BL323), Bell County, Texas, have contributed substantially to the near-final dissolution of the venerable Clovis-First paradigm both chronologically and behaviorally. Specifically, the excavations at Gault reveal that humans are present in central Texas some 3,000 years before the Clovis horizon and, further, that these first Texans are probably not specialized big game hunters. Additionally, the Gault excavations indicate that the Clovis culture, itself, is in need of redefinition as the Clovis horizon at Gault is not representative of a rapidly transient population of spear-toting, big game hunters. Collins continuing reluctance to address the profound implications of the Gault research is also addressed.

Adovasio, J. M. [222] see Freund, Kyle

Agenten, Courtney [193] see Malo, Erika

Agnew, Neville [111] see McClintock, Thomas

Agostini, Mark [120] see Van Keuren, Scott

Agurcia Fasquelle, Ricardo [130] see Pineda de Carias, Maria-Cristina

Ahern, Kaitlin (University at Buffalo)

[189]

An Analysis of Lime Plaster Samples from the Holmul Region

During the summer of 2018 and 2019, the author collected 22 lime plaster samples from the ancient Maya sites of Cival, Holmul, and Witzna. These three sites are located in the Holmul region, which is located in the Petén, Guatemala, along the border with Guatemala and Belize. The majority of the plaster samples were collected during the Holmul Archaeological Project's 2018 field seasons at Holmul and Witzna. These plaster samples were analyzed via thin-section analysis, SEM-EDS, and PXRF with the goal of determining the elemental and chemical composition. Comparative analysis was conducted to determine the variations between the plaster samples and provide insight regarding the interactions between these three sites and the practices involved in the selection of raw materials and plaster production.

Ahlman, Todd (Texas State University), Ashley McKeown (Texas State University), Nicholas Herrmann (Texas State University) and Fred van Keulen (St. Eustatius Center for Archaeological Research)

[215]

The 2019–2020 NSF REU Exploring Globalization through Archaeology Archaeological, Bioarchaeological, and Geophysical Investigations on St. Eustatius, Dutch Caribbean

The second year of the National Science Foundation (NSF) Research Experiences for Undergraduates (REU) Exploring Globalization through Archaeology project included archaeological investigations of the sugar works site (SE095), bioarchaeological investigations of an eighteenth-century cemetery (SE600), and geophysical survey of the SE095 slave village, SE127/410 Lazaretto area, and two cemeteries. The various projects allowed the NSF REU students the opportunity to undertake a wide variety of research projects. The posters in this session exemplify this diversity and the broad range of research undertaken by the NSF REU researchers. This poster presents an overall picture of the 2019–2020 session to introduce the overall project as well as highlight the student research.

[215]

Chair

Ahlman, Todd [215] see Black, Reece

Ahlman, Todd [215] see Fields, Mara

Ahlquist, Tia (Arizona State University)

[185]

Oral History of the Teotihuacan Research Laboratory

Archaeologists study the past. What's often missing is the story of the archaeologists' interaction with the land and its people, and the impact their presence has had on the region, the academic discipline, and the future. These stories are not missing; they are alive in the memories of those involved, but someone has to shed light on those stories and make them known before it is too late. In the case of the ASU's Teotihuacan Research Laboratory in San Juan Teotihuacan, Mexico, there is a decade's worth of histories yet to be shared. It has been to the home of many groundbreaking research projects over the years and continues to be an important fixture in Mexican archaeology today. The Teotihuacan Mapping Project, a legendary undertaking by George Cowgill and René Millon beginning in the 1960s, remains one of the greatest archaeological feats to this day. Since then, the Teotihuacan Research Laboratory has become the base of countless other research projects, a foundation for international collaboration, and home to an unmatched collection of artifacts. It is an important part of both ASU and Mexican history, and a treasure to the archaeological community. This is its story.

Ahlstedt, Steve [78] see McKenna, Kathryn

Ahlstrom, Richard (HRA Inc. Conservation Archaeology)

[229]

Introducing a Database of Tree-Ring Dated Puebloan Pit Structures

Prehistoric and early historical period Puebloan pit structures are characterized by a succession of appendages to their southeastern quadrants, including lateral entryways, antechambers, ventilators, recesses, and platforms. The documented history of these features is reviewed through the lens of a database of tree-ring dated structures, including approximately 250 pit houses and 100 kivas, that can be reliably assigned to 25-year intervals between AD 200 and 1625 (mostly to AD 425–1475) and, often, to substantially narrower intervals as well. The data are assessed for their contribution to the history of these feature types, but also for their usefulness in documenting rates in the adoption and spread of the architectural features over space and time, the "holy grail" of archaeological chronology.

Ahrens, Birte [62] see Piezonka, Henny

Aimers, Jim (SUNY Geneseo)

[93]

Discussant

Ainsworth, Caitlin (University of New Mexico)

[129]

Singing for Their Supper: An Exploration of Bird Domestication Processes

Birds have played an important role in people's lives throughout human history. In bird watching clubs and at turkey dinners, from feather capes to figurines, and on pots and petroglyph panels, evidence of humanity's long fascination with birds is all around us. Birds were, and continue to be, prized as sources of food, feathers, companionship, beauty, and song. Yet despite birds' ubiquity in humans' lives, very few bird species were ever fully domesticated. They mostly occur in the archaeological record as fully wild or, less commonly, captive animals. The universal importance of birds but their infrequent domestication raises questions about the incentives for and impediments to bird domestication. This paper explores the factors acting for and against bird domestication using avifaunal data from Pottery Mound, New Mexico.

Aiuvalasit, Michael (Illinois State Archaeological Survey, University of Illinois)**[171]***Domestic Water Insecurity, Climate Change, and the Long-Term Sustainability of Communities: A Case Study of Ancestral Pueblo Dryland Farmers in the Jemez Mountains, New Mexico*

Water used for consumption and domestic purposes is rarely the subject of archaeological study, even though humans must acquire and consume water every day. Archaeological examples of how societies in arid lands met their domestic water needs are increasingly relevant to present-day concerns about water insecurity on our hotter and more crowded planet. Through a case study of domestic water management practices by nine Ancestral Pueblo farming communities in the Jemez Mountains of New Mexico (AD 1100–1600), I demonstrate the utility of merging interdisciplinary geoarchaeological and geospatial studies with interpretive frameworks from socio-hydrology for studying domestic water. This study shows how tradeoffs for developing robust collective action strategies to manage one resource (i.e., agricultural production) can introduce fragilities in other resources (i.e., domestic water). Feedbacks generated by hydrological and agricultural droughts in the fourteenth and fifteenth centuries made some, but not all Ancestral Pueblo communities in this study area vulnerable to periods of water insecurity, suggesting that communal decision-making surrounding resource management is critical to the long-term sustainability of communities.

Aiuvalasit, Michael (Illinois State Archaeological Survey, University of Illinois)**[220]***Discussant*

Akins, Jamie [85] see Lorenz, Wayne

Akoshima, Kaoru (Tohoku University) and Hyewon Hong (Tohoku University)**[162]***For Identification Standards of Lithic Use-Wear in the East Asian Paleolithic*

This paper investigates methodological aspects of functional inferences made on the basis of microwear analysis of lithic artifacts. Various use-wear traces are static facts in the present world, while behavioral episodes utilizing stone tools were dynamic processes of the past cultural system. Thus, fundamental principles of the Middle Range Theory in the sense of Binford (1981) apply to experimental microwear analysis. The uniformitarian assumption applies to the physical facets of controlled experiments, while factors such as ancient environments, lithic raw materials, and technological diversities interfere in making reliable functional inferences. More than forty years of experimental work by the Tohoku University Microwear Research Team has identified essential problems of use-wear study as middle range research. This paper presents standardized identification criteria such as micro-polish charts and microflaking patterns. Examples from Northeastern Japan, especially from the Mogami River Upper Palaeolithic research project, are used to develop a dependable inferential framework. Some cases from the Korean Peninsula are also examined for inter-regional applicability of the Tohoku University methodology, which integrates both high power and low power approaches.

Alaica, Aleksa (University of Toronto)**[106]***Herding and Late Moche Politics: Camelid Offerings as Long-Distance Tribute, a Look through Stable and Radiogenic Isotopic Evidence from Huaca Colorada, Jequetepeque Valley, Peru*

To explore the dynamics of the north coast region, trading networks and camelid husbandry needs to be at the forefront of conversations about mobility, diffusion, stylistic integrations and local transformations. The Late Moche site (AD 650–850) of Huaca Colorada has a large assemblage of camelid remains that attest to their use in feasting events, quotidian activities and for long-distance interactions. Recent stable and radiogenic isotope analyses indicate that the camelid remains from Huaca Colorada are highly diverse, with evidence of consistent contact with the highlands and other coastal regions. The diverse use of these animals in food sharing traditions as well as for ceremonial offerings suggests that camelids were considered extended kin. I argue that trade groups and agro-pastoralists considered their camelid herds as valued socio-political and ideological offerings for large feasting events occurring in the southern Jequetepeque Valley in the Middle Horizon. Through the offering of camelids these transient groups were forging strong social and political bonds among north coastal groups but also with communities farther abroad. It was through camelid herding that the division between 'them' and 'us' was broken down and allowed for meaningful interactions between groups to occur.

Alaica, Aleksa [61] see Belisle, Veronique

Alaica, Aleksa [61] see Biwer, Matthew

Alaica, Aleksa [86] see Jennings, Justin

Alamseged, Zeresenay [55] see Coon, Sarah

Alaniz, Alfred [16] see Perez, Gary

Alarcón Tinajero, Edgar (University of Georgia) and Samuel Hillman (University of Edinburgh)**[119]***Biodistance at the Core of Empire: Biological and Cultural Admixture in Early Colonial Mexico City*

Indigenous North American communities were marred by violence, displacement, epidemics, and demographic loss in the sixteenth century wake of European contact. Historical documents attest to the relocation of entire communities and coalescence of new

ones, including San Gregorio Atlapulco in the southern Valley of Mexico. Across North America, sixteenth and seventeenth century transformations came about through population movements, cultural admixture, and genetic admixture between Native Americans, Europeans, and Africans. Non-metric dental variation from skeletal remains excavated at the San Gregorio Atlapulco cemetery elucidates biological change of the initial Colonial period in one region. Interpretations of sex-based differences in biological variation from the adults at this cemetery site are presented. Preliminary interpretations explain the dearth of typically-European dental traits and preponderance of typically-indigenous ones. A narrative of sociobiological continuities despite ideological transformations at San Gregorio Atlapulco is substantiated by sparse evidence of gene flow between Europeans and Native Americans, a high proportion of cranial modification among individuals, and a site-wide burial arrangement consistent with a Christian context. This research, and similar bioarchaeological approaches, scrutinizes our understanding of the varied experiences of indigenous people in a new colonial order.

Alberg, David [231] see Casserley, Tane

Albert, Katherine (University of Massachusetts, Boston) and Heather Trigg (University of Massachusetts, Boston)
[112]

Understanding the Construction of Seventeenth-Century Spanish Colonial Architecture and Its Role in the Process of Colonizing the American Southwest

Previous work on Spanish colonial architecture in seventeenth-century New Mexico focuses primarily on the construction of religious and civic architecture; it is rare to find literature about domestic architecture from this time period and region. As such, a large aspect of Spanish colonization of the American Southwest is not well understood. This paper aims to address this gap in knowledge of Spanish colonial architecture by investigating the construction and role of the architecture of LA 20,000, a seventeenth-century ranch (estancia) in New Mexico, in the processes of Spanish colonization of indigenous Pueblo and Plains peoples of the American Southwest. Using architectural data recovered from the excavations at LA 20,000 in conversation with similar case studies of Spanish colonial architecture, we offer interpretations of what the structures of the estancia may have looked like, and what materials and labor efforts were used to construct them. From this, we see a lack of physical separation between the colonizer and colonized, which has ramifications for the social interactions between them.

Albert, Rebecca (University of California, Santa Barbara) and Susan Kooiman (Southern Illinois University, Edwardsville)
[235]

Exploring Potential Contamination of Domestic Microbotanical Remains in Carbonized Food Residues

Microbotanical remains, such as starches and phytoliths, provide useful insight into the origins of agriculture and early regional adoption of various cultigens. Maize microbotanicals in carbonized food residues adhered to ceramic cooking vessels have been dated as early as 300 BC throughout the Upper Great Lakes region, which is earlier than macrobotanical evidence for maize in the area. The Cloudman site (20CH6), on Upper Michigan's Drummond Island, provides an excellent opportunity for temporal studies of diet and early agricultural practices because of its occupational history, spanning the Middle and Late Woodland periods. The goal of this study is to determine if microbotanicals present in soil from historic and modern farming practices could have resulted in false positive findings of maize and squash microbotanicals present in the carbonized residues recovered from ceramic rim sherds from the Cloudman site. Soil samples were chemically floated to separate starches and phytoliths from sediment and will be microscopically analyzed. If no microbotanical remains for maize or squash are present in the soil samples, this can increase confidence in the findings of maize phytoliths and starches present in charred residues dated to AD 100 at the Cloudman site.

Albrecht, Kendal [180] see Rademaker, Kurt

Alconini, Sonia (University of Virginia)
[61]

Inka Kallawayas: Cuisine, Identity, and Status Negotiations in the Eastern Imperial Fringes

The Kallawayas were valued traveling shamans and herbal healers of the Tawantinsuyu that dwelled in the eastern valleys of the Titicaca basin. Located along an ancient trading route that penetrated deep into the tropical Yungas was the Inka center of Kaata Pata, conceived as the mountain's heart. Excavations in this center have revealed its sociopolitical importance, as lavish feasting events were recurrently celebrated. Such commensal celebrations, targeted to elite segments in the region, comprised conspicuous consumption of camelid meat and chicha corn beer served in elaborate serving vessels in the Inka Taraco Polychrome and Urcosuyo Polychrome styles. Using faunal data, archaeobotany, ethnohistory and stylistic ceramic analyses, this presentation will explore Inka cuisine and identity construction, and the ways in which indigenous elite segments attained status and power in the eastern imperial fringes.

Alconini, Sonia (University of Virginia)
[224]

Discussant

Alcover, Omar (Brown University) and Ricardo Rodas (Universidad de San Carlos, Guatemala)
[128]

Protoclassic Maya Warfare: The Social and Political Role of Violence between 100 BC and AD 400

In the Maya area, archaeological research on warfare has most often focused on the centuries leading up to the dissolution of Classic period divine kingship, or otherwise on Postclassic conflicts in the Yucatán and Guatemalan highlands. Recent research,

though, reveals that periodic, traumatic incidents of warfare were an early component of Maya social and political life. By the Protoclassic period (100 BC–AD 400), war seemed to have intensified as many early, nonfortified settlements were either abandoned in favor of more defensive spaces, or perimeter walls were constructed around them. In this paper, we synthesize the evidence for armed conflict during the Protoclassic period, addressing the form and function of defensive systems, regional variability in practices of war, as well as the sociopolitical consequences of warfare at this time. Specifically, we will draw on findings at the site of Macabilero, Guatemala, which may exemplify fortified sites of the Protoclassic period more generally. Overall, we argue that in the Maya Lowlands, early fortifications may have served as points of resistance to political reorganization and the burgeoning institution of kingship; a means to rally around limited resources; or a way to control emerging trade networks and the movement of people.

Alcover, Omar [265] see Rodas, Ricardo
Alcover, Omar [202] see Schroder, Whittaker

Alday, Camila
[74]

The Preceramic Plant-Fiber Technology of South America

The Preceramic hunter-gatherers (cal 10,000–3700 BP) who inhabited the Pacific littoral of South America highly relied on plant resources from wetlands, fog oases, and riparian zones. We now know that Preceramic fibers markers from the Peru-Chile desert were aware of the nature of wetland plants as suitable fibers for the fabrication of clothes, cordages, fishing gear, and mats. Here, I examine how the plant-people bond was forged through the procurement of wetland plants used for this technology, as well as the impact of the uninterrupted technological encounter of people and plants had on the organization of the daily life during the Preceramic period. Archaeobotanical analysis of artifacts made of Cyperaceae, Typhaceae, and Gramineae reveals how people seized the plant anatomy to turn them into textile fibers. I also discuss the economic impact of the fabrication of fishing nets and fishing lines on the Preceramic foraging lifestyle and the role that yarns, and mats as composite technologies played in coastal populations. Finally, I propose a narrative of the entanglement of people and plants before the advent of the agriculture in Ancient South America, in which the fabrication of plant-based artifacts set the foundation for the development of Andean textile technology.

Aldenderfer, Mark [252] see Iizuka, Fumie
Aldenderfer, Mark [233] see Noe, Sarah

Alex, Thomas
[164]

Jose's Cantina: A Seasonal Observation Site in Big Bend National Park, Texas

Casual observations at Jose's Cantina, a prehistoric rock shelter in the Chisos Mountains, revealed a set of pictographic imagery assumed to be associated with tracking the winter solstice seasonal change. Petroglyph imagery suggests association with annual renewal and rebirth ritualism. The variability of a set of motifs may be better understood through use of ethnographic analogy. The artifact assemblage collected from the site surface includes a Late Archaic dart point, maize, basketry, and fiber materials typical of the Late Archaic in the Big Bend Region of west Texas. The presentation discusses ongoing study and provides a glimpse at a most singular Late Archaic rock imagery site and its petrographic association with other sites in the Big Bend region of west Texas.

Alexander, Rani (New Mexico State University)
[138]

Landscapes of Inequality in Ebtun, Yucatán, 1800–1890

In this paper, I examine the postcolonial social transformations of Yucatec-speaking communities located southwest of Valladolid, Yucatán, occasioned by the Caste War (1847–1901), a violent rebellion and revitalization movement intricately related to processes of decolonization following Independence. How did native leaders negotiate the imposition of liberal and anticlerical political-economic policies after Independence? Did the Caste War affect wealth disparities among these rural communities? How did they emerge from the Caste War and rebuild the socioeconomic fabric in the twentieth century? Using the wills and testaments from the Titles of Ebtun and nineteenth-century censuses from the Archivo General del Estado de Yucatán, I calculate GINI coefficients to analyze variation in household material wealth, social mobility, and inequality in the nineteenth century. My results indicate that the strategies and practices through which community leaders accumulated and transferred wealth to descendant generations reproduced sociogeographic identities into the twentieth century.

Alfonso-Durruty, Marta (SASW, Kansas State University), Nicole Misarti (WERC, University of Alaska, Fairbanks) and Andres Troncoso (Universidad de Chile)
[243]

Stable Isotope Evidence of Dietary Trends among Prehistoric Populations from the Semiarid Region, Chile

The semiarid region of Northern Chile (29–32°S) is a transitional ecological area, located between the extreme hyperarid conditions of the Atacama Desert and the Mediterranean ones of Central Chile, with a long history of human occupation (Archaic Period—Late Period). This study evaluates the stable isotope signatures, $\delta^{13}\text{C}_{\text{Cap}}$, $\delta^{13}\text{C}_{\text{Col}}$, and $\delta^{15}\text{N}$, of individuals from the coast and inland for the entire temporal sequence. Among coastal groups, marine resources are central throughout the prehistory of the region but $\delta^{15}\text{N}$ decreases over time. In contrast, $\delta^{13}\text{C}$ increases over time. In the inland, $\delta^{15}\text{N}$ levels remain stable, while $\delta^{13}\text{C}$ increases. Among coastal groups there is a higher degree of diversity in $\delta^{15}\text{N}$ and $\delta^{13}\text{C}_{\text{Col}}$ during the Middle Period, and in $\delta^{13}\text{C}_{\text{Cap}}$ during the Late Period. Among inland groups variability in $\delta^{13}\text{C}$ is highest during the Early Ceramic period, whereas $\delta^{15}\text{N}$ is most variable during the Late Intermediate period. Overall, the results indicate a late introduction of C_4 plants both in the inland and along the coast, and a

dietary variation that although limited, likely emerged from differences in preferences, access, mobility, and the changing meaning of foods.

Alfonso-Durruty, Marta (SASW, Kansas State University)

[61]

Chair

Alfonso-Durruty, Marta [119] see Morello Repetto, Flavia

Ali, Abdallah K. [216] see Fitton, Tom

Allard, Francis (Indiana University of Pennsylvania) and Lauren Glover (University of Wisconsin, Madison)

[28]

Stone Beads along the Maritime Silk Route: A View from Hepu's Han Dynasty Burials

Situated at the northern end of the South China Sea, the coastal site of Hepu in Guangxi Province played an important role in the development of the "Maritime Silk Route" following its incorporation into the Han Empire in 111 BCE. Hepu's Han dynasty burials have yielded large quantities of objects of nonlocal manufacture, pointing to China's emerging involvement in trade networks which extended to Southeast and South Asia. This presentation focuses on the stone beads found at Hepu, whose source materials (garnet, agate, carnelian, chalcedony, beryl, and turquoise) are thought to have originated in South Asia and other distant regions. Hepu's stone beads are compared to beads excavated at other sites in Southeast Asia and southern China, providing insights into the nature of trading networks which reached southern China. As a way to investigate the beads' possible sociopolitical associations, the presentation also looks at their distribution among Hepu's burials.

Allaun, Sarah [180] see Mahan, Chase

Allen, Bryan [230] see Coughenour, Chance

Allen, Christian (Midwest Archeological Center)

[239]

Coalescing Communities of Practice: Assessing Intrasite Ceramic Spatial and Element Compositional Variability Using pXRF and GIS at Mialoquo (40MR3) a Mid-Eighteenth-Century Cherokee Community in East Tennessee

This is a preliminary study of the Mialoquo site (40MR3) an eighteenth century Cherokee town located in Monroe County in East Tennessee. Multiple analyses were used to assess the social organization of the town; including ceramic typological, spatial and element compositional analyses. The results of the analyses indicate that the Mialoquo community was founded by at least two communities of practice. Portable X-ray Fluorescence (pXRF) analysis of 146 ceramic sherds identifies both local and non-local products at the Mialoquo site. Additionally, while both shell- and grit-tempered vessels were produced from clays local to the site, those sherds produced with shell-temper had a much broader range of clay sources. The implications of these results suggests that some of these shell-tempered sherds were produced from non-local clay sources, likely as ceramic vessels transported to the site from neighboring towns. The pXRF and spatial analyses results demonstrate that the communities of practice at Mialoquo were highly blended sharing their domestic spaces, disposal middens, and clay procurement locations.

Allen, Julie [27] see LeFebvre, Michelle

Allen, Mitchell (University of California, Berkeley) and William Trousdale (Smithsonian)

[205]

The Bronze Age in Afghan Sistan

Knowledge of the Bronze Age in eastern Iran and Afghanistan is substantial, including the well-studied sites of Shahr-i Sokhta, Nad-i Ali, and Mundigak. But a key component, the settlement pattern along the Helmand River—the major conduit that links those sites as well as being an important pathway between West, South, and Central Asia—is almost unknown. The Helmand Sistan Project, co-sponsored by the Afghan Institute of Archaeology and the American Smithsonian Institution, was the first long-term attempt to systematic survey and excavate in the lower Helmand Valley. In the field in the 1970s, its findings are only now being analyzed and published. This presentation will describe the Bronze Age sites identified by the Project along the Helmand and how they reshape our existing knowledge of this region. The interaction between cultural, hydrological, and climatological forces will be highlighted, as well as the difficulty in identifying and understanding Bronze Age settlement in this area. The result will be a more complete understanding of this region and its role linking the major cultural areas on all sides.

Allen, Susan [255] see Forste, Kathleen

Allen, Zach [8] see Brown, James

Almeida, Ana

[108]

The Lure of the Sea: Objects and Behaviors

It is generally accepted that Iron Age folk left the sodden lands in the valleys of large rivers and choose to settle on high ground, in locations with natural defenses, but very often near water sources. Agro-pastoral interests likely were part of the decision, but so were proximity to the mouth of major rivers and to the sea. These factors allow for relating Iron Age hilltop settlements to other profitable activities, such as fishing, gathering of seafood, control of fluvial and sea routes as well as the production and trade of salt. The geographic location of the S. Lourenço Castro on the coast of Esposende and near the mouth of the Cávado River enabled these activities. This paper discusses the archaeological objects and behaviors associated with those practices.

Almer, Calista (Smithsonian), Michael Mlyniec (Smithsonian) and Igor Chechushkov (Smithsonian)

[176]

Site Patterning of Two Boulder Field Sites from the Lower North Shore of Quebec: Implications for Dating, Social Organization, and Future Research

Boulder field sites frequently appear along the shorelines of Labrador, Newfoundland, and the Quebec Lower North Shore. These sites, located on raised beaches, in past research have been believed to represent habitation structures and features related to storage and fish processing, ranging from the Maritime Archaic Period-Paleo-Inuit/Dorset cultures (3000 BC-AD 1000). Despite many of these sites having been identified, little research has been conducted due to the lack of artifacts found at these loci. Traditionally, they were dated using climate and geographical data as a proxy for cultural material. The purpose of this pilot study was to indicate meaningful trends to allow for better differentiation between these sites, thus resulting in a better understanding of the distribution and cultural patterns within the region exhibited by the early cultures inhabiting it. This poster seeks to explain the mapping of these two sites and the differences recorded in their organization and implications for increased social complexity seen at one and not the other, thus allowing for a plan of future research to be undertaken within the region.

Alonso, Alejandra, Soledad Ortiz (Instituto de Investigaciones Filológicas), Oscar de Lucio (Laboratorio Nacional de Ciencias para la Investigación y la Conservación del Patrimonio Cultural), José Luis Ruvalcaba (Laboratorio Nacional de Ciencias para la Investigación y la Conservación del Patrimonio Cultural) and Luis Barba (Laboratorio de Prospección Arqueológica)

[20]

The Art of Processing Limestone into Lime in the Maya Lowlands: The Characterization and Technology of Plaster Decorations from the Preclassic to Late Classic Periods

This work is a comparative study for explaining the processing of limestone for the production of lime. The Maya used lime plasters for protecting and decorating civil architecture. Our study includes wall and floor samples dating from Preclassic to Terminal Classic Periods. This study elucidates how lime processing transformed into a standardized industry. The examples presented in this work identify the quality of stone selected for the production of lime, as well as the technology employed for producing lime more efficiently through time. Our intention is to determine the burning temperatures responsible for producing lime with different properties, and how this part of the technology directly affects the preservation of plastered floors and walls in the architecture. We concentrate in establishing the connection between calcination temperatures and the morphology and technology of kilns. We determine how these elements, modified through time, help reduce energy waste. We propose a particular method to measure and compare pyrotechnic indicators to determine subtle variables in our samples coming from different sites of Yucatán. The expected result of this work is to identify cultural and regional patterns in the extraction of limestone for the production of lime.

Alonzi, Elise (University College Dublin), Barra Ó Donnabháin (University College Cork) and Kelly Knudson (Arizona State University)

[134]

Vows and Violence: Diet and Mobility at Tintern Abbey, Ireland

Diet, mobility, and trauma are key factors in the performance of social identities and the maintenance of social boundaries between groups. In medieval Ireland, burial at monasteries also provided an opportunity for both lay and ecclesiastical communities to represent the religious identities of deceased individuals. In this study, mobility, trauma, and diet are investigated at Tintern Abbey, Co. Wexford, Ireland (thirteenth–sixteenth centuries AD) in relation to estimated membership in the lay or ecclesiastical community. The prevalence of trauma that likely indicates interpersonal violence is notably high at Tintern Abbey. Osteological analyses, in addition to carbon, strontium, and oxygen isotope values, will be considered for 24 individuals at up to three periods in life. Despite Tintern Abbey's connection to other Cistercian abbeys in Wales and across Europe, the ecclesiastical individuals did not experience significantly more mobility than the lay community members. The most notable factors that differentiate the lay and ecclesiastical groups are diet and trauma, whereas individuals in both groups undertook mobility. This study finds that trauma and diet are the important performative divisions between lay and religious groups at Tintern Abbey. In contrast, mobility was likely most influential in forming an individual's identity within the group.

[134]

Chair

Alsgaard, Asia (University of New Mexico), Carolyn Freiwald (University of Mississippi), Stephanie Orsini (Coastal Environments Inc./Moore Archeological Co), Douglas Kennett (University of California, Santa Barbara) and Keith Prufer (University of New Mexico)

[270]

From Armadillo Scutes to Peccary Skulls: Changing Foraging Efficiency during the Transition to Agriculture in Southern Belize
Globally, the transition from hunting and gathering to agriculture was a co-evolutionary process between humans, plants, and

animals with many potential drivers. Using zooarchaeological analysis and predictions derived from evolutionary ecology, we test for the underlying drivers of the transition to agriculture in southern Belize. We use prey and patch choice models to test for changes in foraging efficiency in the animal portion of the diet during the critical juncture between 5000–1000 BP when forager-farmers were transitioning to more intensive forms of maize-based food production. Our zooarchaeological dataset comes from Mayahak Cab Pek, a rockshelter located in the interior of the Maya Mountains in southern Belize containing a 10,000-year transect of faunal deposits across the Holocene. The taxa of the faunal remains mirror all the endogenous species found in the region today. Additionally, the deposits contain a human, paleoethnobotanical, and lithics, excavated from stratified excavations anchored to over 100 precise AMS radiocarbon dates. These provide the context for a high-resolution view into animal exploitation prior to and following the agricultural transition.

Altschul, Jeffrey (SRI Foundation/Coalition for Archaeological Synthesis)

[58]

The Once and Future Promise of CRM

I chose CRM over academics to be relevant. In the ensuing 40-plus years, I find much to be proud of. CRM archaeologists identified lots of sites, saved or excavated those that were important, empowered local and indigenous communities to be part of the process, and learned much about what happened in history. CRM evolved from a fledgling enterprise to a mature industry. What once was a temporary way station is now a career path for more than 10,000 archaeologists in the United States. I'm also frustrated with what we didn't do. We learned a lot about a little, spending our days analyzing and interpreting the remains within project boundaries mostly drawn by others. Rarely, did we try to put things together on temporal and spatial scales that did much more than fill in dots in regional culture histories. Now, in the twilight of my career, I feel compelled to take on one last initiative: to leverage the vast amount of data we collected to address pressing social issues from a long-term perspective that only archaeology can provide.

Altschul, Jeffrey (SRI Foundation/Coalition for Archaeological Synthesis)

[115]

Moderator

Altschul, Jeffrey (SRI Foundation/Coalition for Archaeological Synthesis)

[207]

Discussant

Alvarado, Jazmin (CEA UNAM) and Daniel Pineda (CEA UNAM)

[121]

Uso de plantas a través de restos macrobotánicos en dos sitios en el norte del estado de Durango

Uso de plantas a través de restos macro botánicos en dos sitios del norte de Durango. Buscamos presentar los resultados preliminares que hemos obtenido a partir del análisis de restos macro botánicos (principalmente semillas) en dos sitios en el norte del estado de Durango: Los Berros y Trincheras ambos siendo asentamientos de poblaciones sedentarias. El fin de este análisis es obtener conocimiento de las formas de subsistencia que se dieron en estas zonas ya fuera por recolección o la posibilidad de cultivo de las semillas, así también buscando entender la relación de sus habitantes (entonces y actuales) con su entorno.

Alvarez, Elliot

[104]

Improvements and Possibilities in Digital Artifact Processing and Accessibility

With the move to preserve archaeological specimens in digital formats, the concern over the accuracy of current capturing methods, and the dissemination of those results has become increasingly important. Laser scanning and photogrammetry have successfully digitized artifacts on a consistent basis, but are methods that have not been adopted by the community at large, which seeks 1:1 fidelity in reproductions. With the incorporation of 3D modeling programs, such as ZBrush and Autodesk Maya, and techniques including 3D sculpting and painting, we have seen a spike in the level of quality and accuracy of digital assets. This paper will discuss our workflow and compare the resulting 3D models to previous output. Example pieces include objects from the Cravens World: Human Aesthetic collection at the University of Buffalo. These samples were captured using the FARO 8-Axis and Artec Space Spider, later processed using Geomagic Wrap, and refined using ZBrush. This paper will also discuss possibilities for the accessibility of these high fidelity models, in terms of sharing and reproduction for academic purposes. Based on the results of our workflow, we advocate for the wider usage of these applications, and ultimately the broader circulation of archaeological assets in and outside of this field.

Amaral, Márcio [161] see Rocha, Bruna

Amati, Anne [184] see Lofaro, Ellen

Ambler, Bridget

[92]

Discussant

Ambrosino, Gordon (Los Angeles County Museum of Art (LACMA))**[60]***The Rock Art of La Serranía de la Macarena: Previously Undocumented Inscriptions at the Headwaters of the Orinoco River (Meta, Colombia)*

La Serranía de la Macarena (La Serranía) is a prominent geological formation that is located along the Guayabero River, a tributary at the headwaters of the Orinoco River in south-central Colombia. La Serranía and its surrounds hold a large complex of previously undocumented rock art that has remained remarkably well-preserved and that represents a vital, but overlooked, component of the social history of the greater Orinoco River watershed. A survey of La Serranía and its surrounds in 2016 revealed large quantities of both pictographs and petroglyphs that display distinct relationships between production technique, iconography and geographic settings. GIS mapping was employed to understand the distribution of its rock art and to model its relationships with associated cultural and natural features. Close-range photogrammetric models of select rock art panels were then produced and used as the base for generating high-resolution digital vector renderings. Initial stylistic and contextual analysis indicate similarities between La Serranía's petroglyphs with those of the middle Orinoco River, while its pictographs bear much in common with those of Chiribiquete, to the south. Moreover, these works were likely produced over a period of several millennia, some of which may correspond to the Paleoindian period.

Ambrosio, Arianna**[178]***Crafting in the Maya Hinterlands: Excavations at Tres Hermanas Group T19-1, El Perú-Waka', Guatemala*

Studies of Maya urban economies often neglect craft production activities by hinterland populations, and instead focus on artisans residing within city centers. However, hinterland crafting, was a crucial facet of the overall economies of lowland centers. Over multiple field seasons, archaeologists working the Classic Maya urban center of El Perú-Waka', Guatemala have investigated the Tres Hermanas District, southeast of the city center, where they have recovered substantial evidence on hinterland crafting activities and production. This poster presents new data from the 2019 excavations at one of the Tres Hermanas groups, Group T19-1. A small, unassuming settlement of low mounds, excavation recovered evidence that the T19-1 inhabitants engaged in a variety of different craft activities, which enables a more nuanced understanding of the social, economic, and political dynamics between urban and rural populations, as well as the organization of trade between social classes within a Classic Maya city

Amend, Tessa**[52]***A Low-Impact Archaeological Site Protection Plan for the Orchard Combat Training Center*

The Orchard Combat Training Center (OCTC) is a multi-component military training facility located in the central portion of the western Snake River Plain in southern Idaho. In the summers of 2014 and 2018, two National Register of Historic Places (NRHP) eligible sites were heavily impacted by tank units during training activities. In an immediate response, the Idaho Army National Guard (IDARNG) and Bureau of Land Management (BLM) scoped traditional protective measures such as fences, seibert stakes, signage and concrete barriers 50 m outside all of the NRHP eligible site boundaries. Now, rather than installing physical barriers and signage, the IDARNG proposes to improve training units' spatial awareness, increase accountability and help reform attitudes toward cultural resources. There are other less intrusive options that could not only be more effective but less expensive with fewer adverse effects on the surrounding environment. If these strategies are successful in protecting archaeological sites on the OCTC, this plan could serve as a model in the development of site protection plans at other training installations.

Ames, Christine [193] see Troccoli, Ruth

Ames, Christopher [11] see Collins, Benjamin

Ames, Christopher [140] see Maher, Lisa

Ames, Nicholas (University of Notre Dame)**[134]***"Mountains of water the waves assume": Nineteenth-Century Oceanic Crossings in Emigration, a Phenomenological Approach*

Between 1815 and 1920 over 60 million people emigrated from Europe to the Americas and Australasia. While these migrations cannot be distilled down to a single process or experience defining the complexity of these movements, a common denominator shared by all migrants (albeit infinitely varied in significant ways) was the oceanic crossing. While the volume of those crossings during the nineteenth century led to an industry of passage, which shortened durations and standardize routes, for many there remained aspects of trauma underpinning the journey. While physical injury, exposure to disease, salient weather, and exploitative conditions were real consequences for many migrants, often trauma manifested in the experience of departure itself—the stress of change in physical and social environments, the constructed nature of this new space, loss of agency as passengers on-board, and the sense of a future unknown. This paper considers the experiences inherent in these aspects of the migration process, and the impact it had on the individuals and communities involved. By drawing from historical accounts, materiality of vessels, and a phenomenological experiment in trans-Atlantic crossing by the author, this paper highlights the constitutive coingredience of place and identity in defining experiences of migration by sea.

Anaya Hernández, Armando [178] see Parrott, Nathan

Ancona Aragón, Iliana [128] see Plank, Shannon

Anderson, Amy [15] see McCool, Weston
Anderson, Amy [80] see O'Donnell, Lexi

Anderson, Atholl [100] see Weyrich, Laura

Anderson, C. Broughton (Berea College)
[259]

Slave|Free: Working through, in, and with the Archives in Madison County, Kentucky

Tracing the paper lifeway of George White, a freed slave and property owner, and his descendants, my work considers the materiality of the archives as central to working with enslaved and free populations in Madison County, Kentucky. Located in a rural and struggling community, the county archives are rather poor, with little attempt at preservation, organization, or care. With that said, Madison County is the home to Berea College, which has a history of interracial education and a rich archive concerning the lives of black men and women who attended. George White's paper lifeway sits somewhere in|between these archival spaces. Two points are central to understanding and locating George White and his family. The first is that the archival spaces are indicative of the continued struggle of understanding slave|free populations in this county. The second rests in further exploration of written material as physically and metaphysically demonstrating power. In other words, the documents and the archives fully demonstrate moments of the White family position of slave|free in the present and the past.

Anderson, Cheryl (Boise State University)
[131]

Contextualizing Conflict: Social Theory in the Bioarchaeology of Central Anatolia

Throughout her career, Debra Martin has utilized an innovative, multidisciplinary, and theoretical approach to bioarchaeology. One of her most significant contributions to archaeology has been her pioneering work on violence, utilizing social theory and current methodologies in order to interpret the skeletal evidence. Her scholarship has improved our understanding of the process of violence and how it is affected by social, political, economic, and historical factors. She has emphasized the importance of context for understanding why violence is or is not used a strategy in different circumstances and this nuanced viewpoint on investigating violence will be critical for future studies on this topic. Martin's research has had a significant impact on the next generation of bioarchaeological scholars and this paper aims to demonstrate the influence of her work utilizing a case study from the Middle Bronze Age (ca. 2000–1750 BCE) in central Anatolia. This project examines the skeletal remains of a minimum of 64 individuals that are likely the victims of a battle and incorporates a broader, social theoretical approach to the study of violence and inequality in the past that is a reflection of Debra Martin's vision and mentorship.

Anderson, David (University of Tennessee)
[59]

Mitigating the Impact of Climate Change on the Archaeological Record: Cultural Resource Investigations along the Savannah River as Models of How to Proceed

Archaeological mitigation planning and fieldwork on an unprecedented scale will be necessary to save what will be lost to climate change in the coming years. The approaches taken during the Russell Reservoir project, and other long-term heritage resource management programs in the Savannah River basin, serve as models of what will be needed moving forward. Participating agencies and researchers have made a conscious effort to examine the widest possible range of cultural resources, including studies of prehistoric and historical archaeology, domestic and industrial architecture, history, oral history, and paleoenvironments. Numerous technical and popular reports have been produced, and the collections are permanently curated and remain accessible to this day. Paleoenvironmental research in and near the Savannah River have vastly improved our understanding of human settlement in the basin, and show how this kind of research is a critical part of mitigation planning. Examining old growth forest will be essential, for example, for dendroclimatological research, and the collection of sediment, pollen, charcoal, and other remains in ponds, terraces, and Carolina Bays will be critical for documenting geomorphological, geoarchaeological, and paleobiological conditions. We have no choice: once these sources of information are lost, they are gone forever.

Anderson, David [183] see Wells, Joshua

Anderson, Derek [180] see Miller, D. Shane

Anderson, J. Heath [150] see Kate, Emily

Anderson, Jen [186] see Nielsen, Christina

Anderson, Jennifer, Natalie Bauman and Madison Roberts
[37]

Shovel Testing as a Hypothesis Testing Tool

Shovel testing is one method used by archeologists to test hypotheses regarding where buried sites are located in a given landscape. Shovel tests are generally 30 cm diameter holes that are excavated to no greater than 100 cm below the ground surface. They are typically either placed judgmentally across known areas of high geoarcheological probability or in a grid-like pattern to identify buried cultural materials. In the summer of 2019, anthropology students from the University of Texas at Arlington used shovel testing to test a hypothesis that the previously excavated Way Ranch site (41HY519) expanded beyond the known site boundary. Our poster explains how the location of each shovel test was selected, how the results of each shovel test directed future block excavations, and how shovel test data compared with data from the block excavations.

Anderson, Ridge [147] see Jepsen, Jacob

Anderson, Ryan [135] see Jazwa, Christopher

Andrade Pérez, Axel (Arqueólogo)

[145]

Análisis de escultura en piedra de la fachada Este de la Casa del Sur, Conjunto Monumental de Atzompa, Oaxaca

Se realiza un análisis de los materiales de escultura en piedra localizados en la liberación de la fachada Este de la Casa del Sur. Los restos de escultura se encontraron dispuestos sobre un piso de estuco correspondiente a la primera etapa constructiva, y otros como parte del relleno. Los fragmentos representan elementos del sistema calendárico zapoteca, entre los que destacan algunas representaciones de lagarto, primer símbolo del calendario ritual. Se muestran los resultados de un estudio comparativo con otras representaciones de escultura en los Valles Centrales de Oaxaca.

Andrade Pérez, Axel [145] see García, Dante

André, Lino [34] see Gonçalves, Célia

Andrefsky, William (Washington State University)

[253]

Discussant

Andrews, Bradford (Pacific Lutheran University), Kenneth Hirth (Pennsylvania State University) and Michael Glascock (University of Missouri Research Reactor (MURR))

[133]

State Control or Free Trade: Comparing Obsidian Access at Epiclassic Xochicalco?

This paper presents an analysis of the obsidian sources represented in a collection of artifacts from the elite civic-ceremonial center of Epiclassic (AD 650–900) Xochicalco in Central Mexico. One important question is whether the Xochicalco elites were directly involved in the city's stone tool economy; this question can be investigated by comparing the obsidian sources in the "elite assemblage" to those found elsewhere in the city. Seventy-five obsidian artifacts from this assemblage were analyzed with INAA. The results indicate that the percentages of sources in the elite assemblage are similar to those found in most Epiclassic residential contexts at Xochicalco, although they do differ in some interesting ways. Overall, we conclude that our study does not support direct elite or state control over the acquisition of obsidian consumed at Xochicalco. This finding differs from what has been concluded for many other prominent urban centers in Prehispanic Mesoamerica and thereby contributes to understanding how Mesoamerican flaked stone economies varied over space and time.

Andrieu, Chloé (CNRS Université Paris I La Sorbonne)

[93]

Discussant

Andrieu, Chloé (CNRS Université Paris I La Sorbonne)

[151]

Layers of Times: Archaeology and the Other Pasts

In this presentation, I will share our experiences working at Raxruha, Guatemala. During our fieldwork seasons, we have faced that the archaeological work involves a broad range of different actors, all at different degrees. Interestingly, all actors have diverse and complex relationships to the precolumbian past we study. Maya Q'eqchi communities, rural Ladinos, rich landowners, students, and Guatemalan or French archaeologists are all related differently to the material culture we excavate. Therefore, one of the major questions we have come through is: How do we communicate results and hypothesis of a field project without overwriting other narratives of the same past? We suggest that methodological approaches, such as "symmetrical archaeology," which is usually used to think the epistemology of the discipline, could also be an interesting methodological key in order to consider such issues.

[151]

Discussant

Andrus, C. Fred [237] see Voorhies, Barbara

Andrus, C. Fred [59] see West, Catherine F.

Angelucci, Diego [162] see Cabanes, Dan

Anico, Eddie (Kickapoo Tribe of Oklahoma)
[113]

Discussant

Anja, Behrens [107] see Ebert, Julia

Anthony, Alexander (Syracuse University)

[192]

Less Than Human: The Institutional Origins of the Medical Waste Recovered at the Milwaukee County Poor Farm Cemetery
Poor Laws enacted in the early nineteenth century condemned the most destitute to confinement in almshouses, poor farms, and workhouses. These laws paralleled contemporary Anatomy Acts that turned the unclaimed bodies of individuals who died at those institutions over to medical facilities for dissection, often simultaneously removing anatomization as a punishment for murder. In essence, pauperism became punishable by anatomization. Thus, dissection served the dual purpose of reinforcing social identity amongst the lower class and privileging the social identity of upper-class medical students. This study is an analysis of the material medical waste recovered from the graves of individuals interred at the Milwaukee County Poor Farm Cemetery. My goal is to determine from which medical institution in Milwaukee County the medical waste, and thus the body, originated, in concert with ongoing, collaborative bioarcheological analysis. This study utilizes a presence and absence analysis of types of medical waste found at burial locations alongside bioarcheological evidence for types of postmortem medical intervention in order to determine the institutional origin of the waste recovered.

Anzellini, Armando (University of Tennessee, Knoxville)

[167]

The Family Plot: Burial Patterns, Grave Location, and Kinship at Bethel Cemetery

Mortuary practices, with their spiritual and cultural significance, are often thought to provide a glimpse of social relationships in the community that followed those practices. Thus, patterns of grave location and funerary materials are used by archaeologists to interpret kinship and social networks which may have existed within the community under study. Archaeological interpretations of kinship and social networks, however, rely on assumptions about spatial patterning of graves, similarity in grave goods, and correlations between grave and kin proximity. Bethel Cemetery provides a unique case study in which these assumptions can be tested using a dataset of known burials and create new models that may be used to identify individuals that remain unidentified. By combining genealogical data, results from osteological analyses, geospatial information, and the archaeological analyses of grave goods and coffin styles we can approach the questions of kinship and mortuary practices from a variety of perspectives thereby improving our interpretations of relationships and burial practices at Bethel Cemetery. Thus, with known kinship patterns and histories we can explore models that may better represent the choices made by the living in the interment of their kin, particularly in Euro-American communities, which may extend to other communities around the world.

Aoyama, Kazuo

[93]

Discussant

Aoyama, Kazuo

[265]

Preclassic and Classic Maya Chipped Stone Weapons

How did the Maya use weapons during the Preclassic and Classic periods? Based on the lithic data from Copan, Honduras, as well as Aguateca and Ceibal, Guatemala, the spear/lance points were major chipped stone weapons among the Preclassic Maya. The adaption of the atlatl darts from highland Central Mexico in the Early Classic seems to represent the first significant change in Maya warfare but did not replace handheld spears as a predominant weapon in the Maya lowlands. Throughout most of Maya Classic history, lance points and to a smaller extent dart points were more important than the bow and arrow in Maya warfare. Both notched and unnotched were present in the Copan Valley during the Early and Late Classic periods as well as at Aguateca and Ceibal during the Late Classic period. The results of high-power microwear analysis indicate that obsidian prismatic blade points were mainly used as arrow heads. The bow and arrow were present in Maya lowlands earlier than has been previously suggested. The increase in the production and use of atlatl darts as well as bows and arrows by the Terminal Classic period may signal a change in the practice of warfare.

Aprile, Jamie (George Mason University)

[51]

Looters Can't Steal Everything: Salvage Archaeology at the San Giuliano Necropolis

The Etruscan cemetery around the San Giuliano Plateau has been looted extensively, but salvage excavations of several emptied tombs have yielded results that increase our understanding of the funerary landscape. In the 2018 and 2019 field seasons, two vertically adjacent tombs on a hillside were excavated down to bedrock, both of which revealed complex stratigraphy representing ancient activities related to tomb construction, landscape modification, and funerary ritual as well as post-abandonment damage. In this paper, the results of these two seasons of field work will be presented with special attention paid to the complex long-term formation processes that contributed to the current state of the site, now part of a regional nature park. Discoveries include a

possible hillside pathway, evidence of stone quarrying, an intact exterior cremation grave, and direct evidence of looting practices. Although Etruscan cemeteries are often characterized in the literature by typological uniformity, these excavations suggest that variability may have been common in smaller, less elaborately decorated chamber tombs.

Aquino, Daniel (National Museum of Archaeology and Ethnology of Guatemala) and Juan Melendez (Washington University, St. Louis)

[166]

Of Snakes and Masks: A Contextual and Iconographic Study of Ancient Maya Greenstone Mosaic Masks

We argue that ancient Maya portable mosaic masks, found in high-elite burials across the Maya Lowlands, could have, at some point during the Late Classic period (AD 550–800) and perhaps even earlier, been the ideal insignias of the Kaanul “snake” regime, which in ancient Maya writing is represented by the head of a snake. Following close-up observations of images of snakes, in particular their faces and heads, we noted that their scales present similar features to the tesserae that form the greenstone mosaic masks; for example the Parrot Snake (*Leptophis mexicanus*), which also has a green pigmentation that emulates the greenstone tesserae. Similarly, we believe that the buried pavements that constitute massive mosaic masks at the Olmec site of La Venta could have also been lifelike representations of a snake’s face and head where each individual carved block was used to re-create the scales of this reptile. Therefore, we propose that the main idea behind the prehispanic mosaic technique could have been inspired from the natural world, notably from the scales and scuta of snakes, crocodiles, and turtles.

Arakawa, Fumi (New Mexico State University), Jorden Scott (New Mexico State University), Lindsey Cron (New Mexico State University), Dustin Wagner (New Mexico State University) and Kristin Corl (University of Texas, San Antonio)

[136]

Georgetown Phase Great Kiva in the Diamond Creek Locality of the Northern Mimbres Region

Architectural features of great kivas in the Mogollon cultural area typically consist of a circular or oval shape subterranean structure that is more than 10 m in diameter, and many have been identified in the region. One of the hallmarks of these kivas is their size, and many archaeologists have argued that they were used for ritual activities and political meetings by local and/or regional residents. The South Diamond Creek Pueblo site in Gila National Forest, New Mexico has been the subject of investigation by the New Mexico State University archaeological fieldschool from 2017 to 2019, which targeted the Georgetown phase (AD 550–650) of occupation. The aim of the excavations was to determine the size of the structure, to recover diagnostic features, and to reconstruct cultural and natural processes. This paper presents the results of partial excavations of the great kiva at South Diamond Creek Pueblo, and we compare our results with other Georgetown phase great kivas in the surrounding areas.

Arakawa, Fumi [122] see Cron, Lindsey

Aramayo, Alejandra [4] see Capriles, José

Araujo, Astolfo [232] see Correa, Leticia

Araujo, Astolfo [73] see Okumura, Mercedes

Arazi-Coombs, Sandra (Cibola National Forest and National Grasslands)

[239]

Adaptability of the Commons: Historical Ecology of Land Tenure Patterns in the Sandia Mountains, NM

This paper uses a historical-ecological framework to address land tenure patterns in the Sandia Mountains, located east of the modern city of Albuquerque, NM. In a modern context, the mountains are largely communal spaces where use is regulated under a higher legislative order, in this case a federal land management agency. While the mountains have always been under communal ownership in some regard, the parameters of management, control, and use have shifted along with dramatic upheavals in the socio-political structure of the area. This paper will use ethno-historical data combined with recent survey data to examine how geographically-based cultural identity intersects with land tenure and how these parameters have been contested and negotiated into the twenty-first century.

Arazi-Coombs, Sandra [148] see Pedro Black, Marielle

Archambeault, Marie

[113]

Discussant

Ard, Vincent, Friedrich Lüth (DAI, Berlin, Germany), Vivien Mathé (University La Rochelle, UMR 7266, France) and Antoine Laurent (CNRS-University Toulouse, UMR 5608, France)

[107]

Back to the Field: Megalithic Quarries as a Marker of Neolithic Landscape (Tusson, France)

Known since the nineteenth century, the barrows of Tusson (Charente) is one of “giant” megalithic monuments of Western-Central France built during the fifth millennium BC. This cemetery still counts today three long barrows and two smaller round ones. Probably protected by their dimensions, these monuments have never been excavated. As part of an on-going ANR (French National Research Agency) research project MONUMEN (Monumentality, landscapes and social competition during the Neolithic in

Atlantic Europe), we decided to reinvest the study of these monuments with a multi-method approach using noninvasive tools, such as geophysical survey and lidar, but also through targeted excavations on some of the detected features. These magnetic anomalies of varying morphologies—sub-circular, oblong, or linear—surround some of the tumuli and do not correspond to anything known. Between 2017 and 2019, several were excavated, certifying that these are quarries for the construction of cairns. The almost systematic abandonment of deer antlers, used or not as tools, at the bottom of the quarries, attests to a probably symbolic practice. Their dating is an exceptional opportunity to date the construction of non-excavated monuments and participate in the debate on the emergence of megalithism on the Atlantic coast of Europe.

Ardelean, Ciprian (University of Zacatecas, Mexico & University of Exeter, UK)

[170]

Reflections about Humans of the LGM in Americas: Ontology, Epistemology, and Academic Religiousness

The early peopling of Americas during the Pleistocene is more than a scientific inquiry, a matter of public curiosity or a political-academic scenario: it is mostly an ideological issue, functioning on the basis of paradigms so strong that it almost mimics religion. Many years ago, I approached this topic (coming from other archaeological fields) because I felt attracted by one of the last strongholds of true enigmas and legitimate research questions in world archaeology, a milieu still propitious for adventurous quests, challenging mysteries and real involvement of passions. Mike Collins had a lot to do with my earliest steps and my formation within North-American prehistory. This brief paper—more than a tribute to Mike—is a necessary reflection about how we actually make science today in American prehistory, how we shape our investigations and collaborations, and how we influence students who join us in our search. The presence of humans during of before the Last Glacial Maximum (LGM) is the new territory of dispute between ourselves: a battlefield between ontologies and epistemologies, and between para-religious ego-driven paradigms.

Ardelean, Ciprian [73] see Williams, Thomas

Ardren, Traci (University of Miami)

[93]

Discussant

Ardren, Traci (University of Miami), Michelle LeFebvre (Florida Museum of Natural History), Victor Thompson (University of Georgia), Scott Fitzpatrick (University of Oregon) and M. Jesse Schneider (University of Miami)

[271]

Island Aquatic Environments in the Prehistoric Florida Keys

A range of evidence exists for the occupation of the Florida Keys prior to European contact, yet little is known of the relationship these indigenous people had with better known coastal and inland cultures of south Florida, such as the Calusa. Scholars working on the mainland have suggested that Keys inhabitants could not have supported themselves year-round with the resources available on the island chain, and that the archaeological record of the Keys represents only seasonal occupation. We review multiple lines of evidence for ecosystem resource use including subsistence exploitation, fresh water availability, and tool production to evaluate the potential viability of year-round versus seasonal occupation by indigenous Keys occupants. The Keys were not isolated from the rest of southern Florida, and the shallow waters of Florida Bay provided an integrative mechanism for contact and exchange. We conclude with suggestions for what unique resources from the aquatic environment of the Keys might have been exchanged with mainland peoples.

Ardren, Traci [59] see Jorissen, Philippa

Ardren, Traci [164] see McClean, Xavier

Ardren, Traci [102] see Stanton, Travis

Ardren, Traci [5] see Waite, Danielle

Areche, Rodrigo (Qhapaq Ñan Project)

[21]

Controlling Chili Peppers under the Inka Government: The Case of Huacones–Vilcahuasi in the Cañete Valley

The archaeological research at Huacones–Vilcahuasi, one of the largest architectural complexes and the center of political-administrative power of the local group called Guarco in Cañete valley, is providing new aspects about economic and political organization during the Late Intermediate and Late Horizon. A particular finding from our excavations was one deposit of chili peppers located within elite residence. This paper seeks to examine how local elites from Huacones–Vilcahuasi controlled the distribution and exchange of chili peppers and what was its role in the economic organization in this region under the Inka government.

Arias, Oscar [257] see Yamamoto, Atsushi

Arias, Veronica (West Texas A&M University) and Tarek Rashed (Civilizology LLC)

[248]

Geovisualizing Climatic Conditions at Texas's Largest History Museum

Environmental monitoring is an important aspect of preventive conservation for museums and other cultural institutions. Changes in climate conditions, particularly temperature and relative humidity, over time can have profound effects on the long-term preservation of records and collections. Standard methods for the continuous recording of environmental conditions include the use of data loggers with external sensors for measuring temperature and relative humidity levels. Specialized software then enable the analysis

of these metrics with established guidelines for each type of collection. While these analyses are useful when monitoring changes locally, they fail to show general trends across the breadth of the institution. This paper explores methods to spatially model environmental conditions throughout a museum over time. It details some of the major challenges and limitations in developing a time-enabled geovisualization of climatic conditions at the largest history museum in Texas, which has a building footprint of more than 285,000 square feet. The ability to model geospatially the interior spaces of a large museum over time can result in better management decisions with regards to the suitability of existing exhibition and storage spaces, enhancing the visitor experience, and providing insights on sustainable preservation strategies.

Arieta Baizabal, Virginia (Universidad Veracruzana) and Yuribia Velázquez Galindo (Universidad Veracruzana)

[269]

El sitio olmeca de Antonio Plaza: la vida entre ríos, humedales y dos capitales.

Las recientes investigaciones arqueológicas en la isla de Capoacan, ubicada en la región olmeca, al sur de la costa del Golfo de México, han derivado información importante en torno a la vida de sus antiguos pobladores. Los programas de mapeo digital y recorrido sistemático, llevados a cabo en los años 2017, 2018 y 2019, proporcionan un panorama más claro del patrón de asentamiento de los sitios ubicados entre los ríos Uxpanapa, Coahuila y Coahuila. Asimismo, el análisis de los materiales arqueológicos recuperados en las dos fases antes mencionadas, revela datos que colocan temporalmente al sitio de Antonio Plaza durante el periodo Preclásico inferior y medio. En esta ponencia se presentarán las primeras interpretaciones sobre la dinámica poblacional de Antonio Plaza, un sitio ubicado dentro de los humedales, rodeado de ríos, y ubicado entre las dos capitales olmecas de San Lorenzo, Veracruz y La Venta, Tabasco.

Arieta Baizabal, Virginia [227] see Lira-Lopez, Yamile

Arjona, Jamie

[266]

Noise Pollution: Racism, Noise Control, and the Subversive Textures of African American Blues Soundscapes

Antebellum slave ordinances throughout the South forbade African Americans from holding leisurely music and dance performances on plantations after work hours. In the Jim Crow Era, these oppressive slave codes were replaced with a suite of new laws and ordinances targeting African American leisure. Racist stereotypes derided Black musical performances as embodiments of “noise pollution”, enabling the creation of local “nuisance” laws aimed at regulating dance halls, jook joints, and other music venues. This paper examines the ways in which racialized perceptions of sound and acoustics shaped the evolution of African American blues traditions in Florida during the early twentieth century. Using historical and archaeological evidence from an early twentieth century Florida jook joint, I examine how the rugged acoustics of rural blues joints subverted racist musical conventions and thwarted efforts to police Black leisure establishments. I argue that Blues artists embraced and reimagined “polluted” soundscapes, creatively disrupting racialized attitudes toward musical aesthetics and acoustic architecture. Musicians transformed the sounds of railroad whistles, clanging hammers, and industrial background noise into emotionally resonant rhythms.

Arksey, Marieka (Office of the Wyoming State Archaeologist)

[172]

Donations, Appraisals, and Tax Write-Offs: Trying to Keep Collections off of the Antiquities Market

Every year, museums, repositories, archives, and campuses receive requests by private citizens to accept donations of artifacts and archives. Putting aside some of the difficulties that can arise in confirming the provenience and the legality of non-research collections, some donors request that certain conditions be met for them to consider donating their collection to a facility. Among these requests is that the collection be appraised so that the donation can be used as a tax write-off. While there are some older regulations in place that suggest how to appraise sites and collections (“the commercial or archaeological value of the archaeological resources involved and the cost of restoration and repair,” ARPA) or how to handle IRS forms, the specifics of how to do this in a manner in keeping with relatively rapidly-changing archaeological codes of ethics are often vague, sometimes intentionally so, and they vary institution by institution. This talk describes how the University of Wyoming Archaeological Repository and the Office of the Wyoming State Archaeologist are attempting to navigate this issue and some of the interesting quandaries we have encountered along the way.

[172]

Chair

Arksey, Marieka [193] see Van Etten, Heidi

Arkush, Elizabeth (University of Pittsburgh)

[32]

Discussant

Arkush, Elizabeth (University of Pittsburgh)

[265]

Discussant

Armijo Torres, Ricardo [126] see Gallegos Gomora, Miriam Judith

Armstrong, Douglas [239] see Wallman, Diane

Arnauld, M. Charlotte (CNRS), Eva Lemonnier (Université de Paris 1 Panthéon-Sorbonne) and Julien Hiquet (Université de Paris 1 Panthéon-Sorbonne)

[102]

Classic Maya Population Densities as Seen from Río Bec, Campeche, Mexico

Ideally, every ancient Maya city should be characterized by its population density and its urban agricultural productivity, both closely linked parameters. Even though specific intra-settlement agricultural strategies may have helped to increase productivity, self-sufficiency in basic foodstuffs could not be achieved in packed urban landscapes that lacked enough space for infields. Mobility to outfields maintained in rural intersite areas also helped increase self-sufficiency, yet control by urban populations on those areas depended on social and political factors. In this complex gradient of more or less self-sufficiency, Río Bec can be characterized as a low-density urban landscape with high agricultural productivity in intensified infields in terraced sectors. After evaluating these parameters, we raise two questions. First, in case self-sufficiency was not reached internally between AD 700 and 800 when the population was the highest, what were the conditions of access to rural outfields in intersite areas which were apparently also heavily populated? Second, as the housing system changed at that time with many vaulted multi-room structures built in Río Bec increasing lodging capacities, how should we adapt our occupation index to this new system? Comparative insights are derived from datasets obtained from La Joyanca (northwestern Petén) and Naachtun (central Petén).

Arnauld, M. Charlotte [178] see Thornton, Erin

Arnold, Philip [150] see Puente, Nicholas

Arnott, Sigrid [127] see Maki, David

Arp, Ryan and Steve Swanson (Arizona State University)

[229]

An Ancestral Piro Trail to Zuni Salt Lake

During recent fieldwork for the Bureau of Land Management, we identified an Ancestral Piro trail between the Rio Abajo region and Zuni Salt Lake. The Zuni Salt Lake is an important salt source and religious place for indigenous cultures in the Four Corners area. While several trails dating from prehistoric times to the present are known to link Hopi, Navajo, Zuni, Acoma and Laguna peoples to the lake, no connections with Puebloan peoples in the Rio Abajo region have been identified. We discuss archaeological, historical, and geographical evidence for a trail paralleling U.S. Highway 60 between San Acacia, New Mexico and the Zuni Salt Lake. In the five-mile segment that we investigated, we documented shrines located on prominent topographic features overlooking the trail route. This pattern is replicated in other, uninvestigated portions of the trail route. Diagnostic artifacts associated with these shrines, as well as a date from a basket containing salt, suggest regular use of the trail by the AD 800s and continuing to the late AD 1200s. After that time, it is likely that Ancestral Piro peoples obtained their salt from the Salinas province to the east, with perhaps occasional use of the trail to Zuni Salt Lake.

Arroyo, Barbara (Museo Popol Vuh, Universidad Francisco Marroquín, Guatemala)

[128]

The Protoclassic in the Maya Highlands: The Role of Kaminaljuyu and the New Transformations

Kaminaljuyu was a very large and important Preclassic center. Its advances in hydraulic management, production and exchange of obsidian artifacts, and intensive agriculture, among other accomplishments, allowed the establishment of a long distance exchange network in the Preclassic Central Maya Highlands. Our research has documented a major crisis throughout the site toward the end of the Preclassic, which ultimately culminated in the first large collapse of the site. However, the resilience of its inhabitants during this period of decline allowed for the resurgence of Kaminaljuyu during the Early Classic. This moment led Kaminaljuyu to forge important long-distance relationships with different distant settlements in the Maya Lowlands and Central Mexico. This paper will present information from recent research at Kaminaljuyu focusing on this important moment in history, exploring the various sociopolitical transformations achieved by its inhabitants at the beginning of the Classic period.

Arroyo, Barbara (Museo Popol Vuh, Universidad Francisco Marroquín, Guatemala)

[209]

Discussant

Arthur, John (University of South Florida St. Petersburg)

[86]

Beer and Feasts in the Highlands of Southern Ethiopia: Ethnoarchaeological and Archaeological Perspectives

Feasting and drinking beer by the Gamo Boreda, who live in the highlands of southern Ethiopia, represents status and seniority and has a long tradition of connecting the living with the ancestors. This paper focuses on the archaeological site of Ochollo Mulato (AD 1270–1950) incorporating oral traditions in association with ceramic ethnoarchaeological and archaeological research documenting the importance of beer and feasting by the Gamo Boreda. Elders recount from their oral tradition that Ochollo Mulato is the oldest and most senior of the nine original settlements encompassing the Gamo highlands. Oral tradition and archaeological and ethnoarchaeological ceramic analyses suggest that large-scale ritual feasting with beer and other foods were part of the activities occurring at Ochollo Mulato over the last eight centuries.

Arzate, Mayra**[150]***Ancient Maya Sustainability: A Review of Past Data*

To understand the ancient Maya as a complex society and investigate their views toward sustainability, we must utilize the archaeological record. The goal of this study is to bridge the gap between how the Maya integrated agricultural systems within urban centers and to see how sustainability was the key to the construction of their "green cities." Through characterizing the anthropogenic impact of their various agricultural production systems, it should be possible to drive useful implications for green cities today. Toward that purpose, the information collected will help further understand how this ancient civilization adapted and worked with their natural environment. By using the concept of modern urban planning along with past archaeological data, society will be better positioned to learn from the Maya and their eco-cities to help reflect on the current implementation of urban consciousness and environmental awareness for sustainable development in cities of the present day. The integration of archaeological data will be important to this study, as well as review of scholarly literature on a variety of methods relating to agriculture, urbanism, diet, and social organization among the ancient Maya.

Asher, Brendon [77] see Smith, Heather

Astrup, Peter Moe [252] see Woo, Katherine

Athanassopoulos, Effie [192] see Weber, June

Atici, Levent [27] see MacIntosh, Sarah

Attorre, Tiago (Flinders University) and Sarah Klassen (University of British Columbia)**[28]***Koh Ker Archaeological Project: Remote Sensing of the Inner Courtyard at Prasat Thom*

Angkor was the capital of the Khmer Empire for over 600 years except for one brief period during the tenth century when political control shifted 80 km NE to Koh Ker. Despite Koh Ker's political importance, very little is known about the longevity of the site and its occupation history. This paper presents results from a ground-penetrating radar investigation in the main temple precinct. Understanding the construction sequence of this area is crucial to understanding the long-term occupation patterns and how this was impacted by the movement of the capital to the site in the tenth century. Our results suggest that the area of the main temple is a complex palimpsest. We identify numerous subsurface buildings that may have predated the construction of the central pyramid and others that may postdate it. This new insight provides lines of further research and indicate that the center was an important political and religious site long before it became capital in the tenth century.

Audin, Laurence [197] see Combey, Andy

Augustine, Jonah (University of Chicago)**[105]***Common Sense and the Distribution of the Sensible in Ancient Tiwanaku, AD 500–1100*

This paper will examine the aesthetic and affective construction of political subjectivities within the Tiwanaku state (AD 500–1100). Based on evidence for feasting within the ceremonial core of Tiwanaku and a detailed analysis of the polychrome serving wares that were consumed at these events, I will argue that large-scale rituals were sites at which "common sense" and affective bonds were constructed among members of the political community. Common sense in this context is an adaptation of the Kantian version of the same term, which denotes the subjective capacity for aesthetic judgment. However, unlike Kant, I argue that common sense is culturally constructed. In this vein, I will also be engaging with Rancière's theory of the "distribution of the sensible," which analyzes the relationship between aesthetics and politics. Ultimately, I will be evaluating the degree to which my data from Tiwanaku can be used to contribute to and expand these theoretical frameworks, which attempt to examine political relations through the lens of sense, affect, and pleasure.

Augustinus, Paul [124] see Ladefoged, Theng

Auld-Thomas, Luke**[128]***Regional Settlement Patterns and Social Change: A Wide-Angle View*

Archaeological descriptions of the Protoclassic period in the Maya lowlands—including the abstract for this symposium—do not fail to note that this was a time of widespread population displacement and decline. Yet this claim is more factoid than fact, due to limited research on settlement patterns during the period in question. It remains unclear, for example, whether populations relocated or declined outright, and there has been limited attention to regional variability in these processes, let alone how processes in one area may have been linked to those operating in another. Fortunately, enough settlement data exists to attempt such a systematic analysis. This paper collates settlement data from the Late Preclassic and Early Classic periods across a wide swath of the lowlands and asks what kind of changes are evident in those data, how spatially variable those changes are, and ultimately what mechanisms

might explain them. Such a before-and-after view allows us to begin the process of reconstructing the broad-scale social processes at work across the Protoclassic lowlands.

[128]

Chair

Auld-Thomas, Luke [102] see Canuto, Marcello

Aurore, Val [11] see Giulia, Ricci

Ausel, Erica (Marian University, College of Osteopathic Medicine)

[134]

Multilevel Migration and Interpersonal Violence at the Angel Site: Bioarchaeological Investigations of Trauma at a Large Mississippian Period Community in Southwestern Indiana

The connection between migration and violence is complex and occurs in many social spheres within a single community. Data accessible through archaeological excavations, partnered with bioarchaeological analyses, can provide insights that are otherwise invisible regarding these experiences. To this end, my research explores the patterns of interpersonal trauma and migration observed at the Angel site, a large Mississippian period (AD 1050–1450) community located on the Ohio River, focusing on two key associations. First, the correlation between females with well-healed blunt-force trauma, unusual burial position, and isotopic signatures more similar to Fort Ancient communities suggest an association between non-local origins and violent treatment for some community members. Second, only males from the site exhibit scalping, with one individual, also buried prone, receiving 14 perimortem fractures to their body. These patterns are likely related to social disruptions during the late Mississippian period caused, in part, by the migration of peoples into the area due to sociopolitical instability and climate change. These data are the first from one of the largest Mississippian period communities in mid-continent and corroborate prior bioarchaeological research on migration and trauma for this time period in the Eastern Woodlands of North America.

Austin, Rita [242] see Pott, Laura

Austin, Robert [130] see Marken, Damien

Austvoll, Knut Ivar (University of Oslo)

[263]

Modeling Organizational Variation in Bronze Age Societies along the Coast of Northwestern Scandinavia

This paper addresses organizational variation along the coast of north-western Scandinavia and looks into the theoretical potential of “Collective action theory” to address socio-political variation—both regionally and diachronically. The outcome of the framework shows connectivity between societies but also varied organizational strategies that result in an unbalanced power structure. By capitalising on the maritime trade network up and down the coast, the region of Jæren/Karmøy effectively created a nodal point for wealth accumulation that help situate themselves as a maritime power. However, interdependence and connectivity with other more peripheral region such as Inner Sogn was a requisite for the maintenance of such a power strategy.

Awe, Jaime

[93]

Discussant

Awe, Jaime, Claire Ebert (Northern Arizona University), Lauren Sullivan (University of Massachusetts, Boston) and Jillian Jordan (University of New Mexico)

[168]

INAA Analyses of Cunil and Kanluk Ceramics from Cahal Pech and Their Implications for Determining the Origins of the Earliest Maya Settlements in the Belize River Valley

In his summary chapter in the volume *The Origins of Maya Civilization*, Gordon Willey (1978:401) asked “Exactly who were these first settlers of the [Maya] lowlands, and where did they come from?” Several years before, Robert Sharer and James Gifford had pondered the same question and, based on their stylistic analysis of Preclassic pottery from Barton Ramie, concluded that the early inhabitants of the Belize Valley were likely immigrants from the southern highlands. Other scholars subsequently suggested places of origin in the Mixe-Zoquean regions to the west, or somewhere in the southeastern Maya lowlands. In this paper we report the results of recent instrumental neutron activation analysis (INAA) of Preclassic Cunil and Kanluk ceramics from Cahal Pech, by Ron Bishop, Dorie Reents, and Claire Ebert, and we discuss their implications for determining the origins of the earliest Maya settlements in western Belize.

Awe, Jaime [130] see Fitzmaurice, Rosamund

Awe, Jaime [230] see Hoggarth, Julie

Awe, Jaime [178] see Saldaña, Gabriela

Awe, Jaime [23] see Stemp, W. James

Awe, Jaime [232] see Sullivan, Kelsey

Awe, Jaime [158] see Watkins, Tia

Axelrod, Ella [188] see Jamison, Gregg

Axume, Denise [176] see Carballo, Priscila

Ayala, Sergio (Gault School of Archaeological Research)

[73]

An Experimentally Supported Review of the Oldest Bifaces at the Gault site (41BL323), ca. >16,000 Years Ago cal BP

Lithic analysis of the Gault Assemblage bifaces (older than Clovis specimens) within the excavation Area 15 provided a working set of reference parameters to conduct experimental productions. This presentation outlines the strategies and tool-implement techniques embedded in the Gault Assemblage biface morphologies (technological behaviors) and flake scar signatures to discern both social group and individual level production behaviors on stone. The principles behind the Gault Assemblage bifacial tool manufacturing will be presented, highlighting the cultural elements/traits that differ from Clovis production behaviors. The relationships between material procurement, tool production, and tool type and function will be discussed.

Ayalla, Gianna [24] see Moody, Bryony

Ayers-Rigsby, Sara (Florida Public Archaeology Network)

[193]

Chair

Ayers-Rigsby, Sara (Florida Public Archaeology Network)

[220]

Discussant

Ayers-Rigsby, Sara (Florida Public Archaeology Network), Victoria Dominguez and Valentina Martinez (Florida Atlantic University)

[257]

Preserving Heritage in Coastal Ecuador

Climate change is negatively impacting cultural heritage and archaeological sites worldwide. The site of Balsamaragua, which signifies 2,500 years of human occupation on the coast, is rapidly deteriorating, having lost 10m of shoreline since 2009. Increased awareness and documentation at the site can help us glean valuable information about the past before it is lost forever. This paper will explore the fascinating history of this archaeological site and what is lost to climate change. This paper will also discuss work by the Florida Public Archaeology Network to engage the public in documenting loss of coastal sites in Florida and how this model might be able to help document site loss in coastal Ecuador.

Ayers-Rigsby, Sara [146] see Miller, Sarah

Ayling, Melissa (Vancouver Island University)

[86]

Pouring the Past: A Discussion of Authenticity in Re-created Ancient Ales

Beer, by all archaeological evidence, has been a passion of humanity since before written language. This fermented beverage was the chosen drink of many ancient cultures and societies, for health and nutrition, for the effects of alcohol and for social and religious occasions. Today, the craft beer movement is exploding across the globe; as drinkers explore new styles and flavors, some breweries are turning to the tried and true brews of our ancestors to meet demand. There has been a multitude of academic and commercial attempts to re-create a variety of ancient beers with varying degrees of 'authenticity' employed. These beers range from ancient inspired brews made for modern palates to more authentic recreations using ancient grains, locally sourced ingredients and even using ancient brewing methods and technology. The concept of authenticity and its varying degrees in beer recreation will be explored, as well as the benefits and difficulties surrounding modern attempts to re-create ancient beer. Authenticity in ancient beer recreation will be highlighted through my project with Dr. Marie Hopwood (VIU) and Dave Paul (Loveslack Libations) to make ancient inspired ales that bridge the gap between contemporary and ancient drinkers.

Azar, Madelaine

[166]

Cruising through the Cosmos: Making Sense of "Rim Rider" Effigy Bowl Iconography in the Central Mississippi River Valley

Ceramic rim effigy bowls are found throughout the Central Mississippi River Valley (CMV) from southeastern Missouri to northwestern Mississippi. Characterized by modeled head and tail adornments, these bowls depict a variety of supernatural beings inhabiting the tripartite Mississippian cosmos. However, a comprehensive iconographic analysis of CMV rim effigy bowls has not previously been conducted. Through a systematic review of the CMV corpus, this study provides a potential iconographic model that links aspects of rim effigy bowl style and theme to cosmic referents and ritual practice. The proposed model posits that rim effigy bowls acted as miniature models of the Mississippian cosmos. Additionally, variation in vessel theme and style has strong spatial patterning throughout the CMV, which suggests that religious collectives, such as sodalities, may have produced and used their own rim effigy bowls.

Aziz, Umer [63] see Russ, Jon

Babot, Pilar [174] see Comeca Ramirez, Gianina

Bacha-Garza, Roseann [6] see Gonzalez, Juan

Baci, Erina (University of Michigan), Michael Galaty (University of Michigan), Sylvia Deskaj (University of Michigan) and Haxhi Mehmetaj (Kosova Institute of Archaeology)
[263]

Diachronic Landscape, Environment, and Settlement Patterns in Western Kosova: Results of RAPID-K, 2018–2019

Regional Archaeology in the Peja and Istog Districts of Kosova (RAPID-K) is the first intensive, systematic survey conducted in Kosova. Following two seasons of fieldwork, we are now in a position to begin to explain why people lived where they did at various keys points in the region's history, from the Neolithic to the Bronze Age, through periods of contact with the Mediterranean world, to the present. Regarding the Neolithic-Bronze Age transition, our survey shows a general shift from open settlements to higher altitude locations often referred to as hill forts. However, our project has also produced an exception to the rule in the discovery of Pepaj, a large, flat Bronze Age settlement discovered in 2018. Such "flat" Bronze Age sites are extremely rare in the Balkans, therefore Pepaj presents a unique opportunity to investigate Bronze Age settlement beyond the prototypical hill forts. In "Dardanian" times (the developed Iron Age, ca. 700 BC-400 BC), occupation in western Kosova shifted toward the hot springs at Banjë e Pejës. Finally, the Roman occupation caused existing sites to grow, perhaps influenced by newly emerging roads, like the Lissus-Naissus road, which began at modern-day Lezhe in Albania.

[263]

Chair

Bader, Gregor (Senckenberg Centre for Human Evolution and Palaeoenvironment, Tübingen), Lyn Wadley (Evolutionary Studies Institute), Christian Sommer (Role of Culture in Early Expansions of Humans) and Nicholas Conard (Senckenberg Centre for Human Evolution and Palaeoenvironment)

[11]

A Regional Perspective on the Final MSA in KwaZulu-Natal, South Africa

The final MSA of southern Africa (~40–28ka), represents one of the most understudied technocomplexes in this part of the world. Researchers often focused on earlier time periods or those shortly after, encompassing the transition between Middle and Later Stone Age. Thus, the final MSA remains poorly understood. In KwaZulu-Natal (KZN) only few chrono-cultural markers called hollow based points are known. Since 2016 Umbeli Belli in KZN has revealed new insights on the final MSA and demonstrated that this period features a clear archaeological signal comprising an elaborate method of tool production with a strong emphasis on shaping technology and a well-standardized core reduction method. Here we extend our research on the final MSA on a regional scale. We present a comparative analysis with the final MSA layers Co–Es at Sibudu, dating to ~38 ka BP. Our results indicate that broad terms such as final MSA must be used thoughtfully, to take account of diachronic variability within relatively short time frames at the same site. Despite this variability, the final MSA in KZN provides a clear cultural signal which is distinct from other periods and regions in southern Africa.

Badillo, Alex (Indiana State University)

[268]

Integrating UAV Mapping and SfM Photogrammetry into a Regional Pedestrian Survey of the Ocoña and Chorunga River Valleys in Southern Peru

Technologies of the twenty-first century have revolutionized archaeological practice as 3D documentation equipment has proven to be accessible and affordable. Digital 3D spatial data collection of archaeological remains (i.e., sites, features, and artifacts) is becoming more integrated into traditional archaeological methods every year. The incorporation of twenty-first-century 3D technologies into traditional methods may require archaeologists to rethink and revise current methodological approaches. In this paper, the author discusses a novel approach to regional survey that integrates UAV and other 3D digital technologies into traditional methods. Additionally, the author presents some of the major considerations when integrating 3D data collection methods into archaeological survey. In 2019, members of the Corral Redondo Archaeological Project spent four weeks doing excavations at the site of Corral Redondo while conducting regional survey in the surrounding Ocoña and Chorunga river valleys. Using the 3D documentation technique known as Structure from motion (SfM) photogrammetry, project archaeologists were able to enhance traditional methods of data collection during survey. Photogrammetric methods enabled the survey team to record entire sites, architectural features, and carved stones quickly and effectively. The resultant 3D photorealistic reconstructions are measurable, store much observational/descriptive detail, and can be "revisited" with ease.

Badillo, Alex [189] see Levine, Marc

Badillo, Alex [167] see Myers, Joshua

Badillo, Alex Elvis [268] see Simborth, Erika

Badillo, Melissa and Elizabeth Shikrallah (University of Nevada, Las Vegas)

[150]

Time to Clean House: Analyzing Household Activity in Postclassic Residential Groups at Santa Rita, Corozal, Belize

Previous archaeological research conducted by the Corozal Postclassic Project focused primarily on the Postclassic period at the

site of Santa Rita, Corozal in northern Belize. Through that research, Santa Rita was found to be an important Postclassic Maya city which likely served as the capital of the ancient Maya province of Chetumal. Given the major reorganization that occurred in the Maya Lowlands at the end of the Classic Period, it is useful to more thoroughly understand any changes in the organization of Postclassic Period sites. This research contributes to a better understanding of the Postclassic period by exploring the intricacies of household activity during this time. Research expounds on the implied functions of households and plazuela groups based on the variation between artifact distributions from selected groups throughout Santa Rita, Corozal. Using chronology previously established for the site as the baseline, spatial analysis highlights variation in domestic building functions within and among plazuela groups. Analysis of associated artifact classes infers building function and intensity of use during the Postclassic period.

Bagdi, Stacey [192] see Silverstein, Jay

Bagwell, Elizabeth (Piñon Heritage Solutions)

[121]

Prehistoric Architectural Construction Utilizing Boulders in Durango, Mexico: A Case Study from Santa Maria del Oro

The methods of architectural construction used by the prehistoric inhabitants of Durango, Mexico is poorly understood. This poster compares and contrasts the prehistoric architecture present at an archaeological site along the Rio Sextin near Santa Maria del Oro with the well-known site of La Ferreria as well as architecture from Sonora and Chihuahua.

Bailey, Geoff [252] see Woo, Katherine

Bailey, Shara [11] see Fisher, Erich

Bainton, Nick [188] see Lowe, Kelsey

Bair, Daniel [163] see Terry, Richard

Baires, Sarah

[70]

Moderator

[70]

Discussant

Baitzel, Sarah (Washington University, St. Louis), Arturo Rivera Infante and Martin Polo y La Borda

[242]

So Close, Yet So High: Explorations of a Late Intermediate Period High-Altitude Pastoralist Settlement in the Heart of the Vilcanota, Cusco, Peru

Throughout the past, camelids have sustained human populations in some of the most marginal high-altitude landscape of the central Andes. During the late prehispanic period, camelid herds were pillars of economic wealth and mobility in complex societies, yet these pastoralist communities are rarely the focus of archaeological investigation. The site of Yayamari (4,900 masl) in the heart of the Vilcanota, Cusco, was a high-altitude pastoralist settlement whose residents, though spatially proximate to the Inca capital, inhabited an extremely marginal environment. Located at the base of a volcanic plug that towers over the Sibinacocha Lake and valley, the Yayamari site is situated amidst megalithic rockfall that frames residential and hydraulic infrastructure. Pilot excavations in 2019 revealed two episodes of occupation during the Late Intermediate Period (AD 1200–1400) and the Colonial Period (AD 1532–1650). Faunal remains indicate a pastoralist subsistence reliant on local camelid herds, whereas lithic artifacts suggest that Yayamari's residents participated in supra-regional exchange networks. In addition, reconstructions of the region's paleo-landscape contribute to our understanding of the site. The results of our study highlight the marginal yet interconnected nature of high-altitude pastoralists at the core of the Inca Empire during the transconquest period.

Baitzel, Sarah [242] see Corcoran-Tadd, Noa

Baitzel, Sarah [61] see Diaz, Lucia

Bajdek, Brennan (Logan Simpson) and Sam Willis (Oregon Parks Department)

[194]

Under the Mazama Ash: Results of Data Recovery Excavations at the Crescent Lake Site (35KL749)

Since 2016, the Crescent Lake Resort in Klamath County, Oregon has been undergoing updates to its infrastructure. The resort is situated on top of a large, stratified, multicomponent prehistoric site, with occupations both pre-dating and postdating the eruption of Mount Mazama over 7,000 years ago. In order to mitigate impacts from utility system upgrades, Logan Simpson conducted data recovery excavations at the site in response to a Section 106 project on the Deschutes National Forest. This work resulted in the recovery of over 10,000 prehistoric artifacts, and the excavation of two buried prehistoric features, including a pre-Mazama single reduction locus and a post-Mazama thermal feature. This paper explores the results of artifact and feature analyses, including typologies, radiocarbon dates, obsidian studies, and blood residue analysis. All of these factors have been compared between the

pre- and post-Mazama components in order to evaluate changes in site occupation over time.

Baker, Caitlin, Sydney Stenstrom (Eastern New Mexico University) and Heather Smith (Eastern New Mexico University)
[148]

Stone-Lined Archaeological Features in East-Central New Mexico: Addressing Function, Chronology, and Culture

Throughout the North American Southwest rock-lined features present on the ground surface are a common occurrence, but they are not always associated with archaeological materials that attest to their function, chronology, and cultural affiliation. They served many purposes for different prehistoric peoples, such as fire pits, storage caches, hunting blinds, and ceremonial areas. During the field season of 2019, the Eastern New Mexico University field school identified several stone-lined features in north-central New Mexico. However, the variety of potential functions and lack of contextual associations with other artifacts make it difficult to address research questions regarding function, chronology, and culture. The goal of this project is to determine if these questions can be informed by morphological and spatial analyses. Results are compared to similar features in the region and ethnographic data collected from local Native American communities.

Baker, Lori

[51]

Osteological Analysis of Two Contemporary Tombs from the San Giuliano Necropolis

This paper will describe and compare the skeletal remains recovered from two small Etruscan chamber tombs from the San Giuliano archeological complex in the Marturanum Park in the Lazio region of Italy. Both tombs, G13-001 and G12-060, are dated to the sixth century BCE using the rich ceramic assemblage that was recovered during field excavations from 2016 to 2018. The tombs have been extensively looted; however, the skeletal remains, although quite damaged and fragmented, were not removed. Results from skeletal analyses including the MNI of the tombs will be discussed. In addition, human cremains were discovered in both tombs scattered throughout. The analyses and comparison of these cremains will be discussed in the context of amount, type, temperature, and cremation process. An intact cremation grave was also discovered just outside of the entrance to tomb G12-060 with a nearly complete red impasto vessel in the pit covered by a bucchero bowl. The contents of the vessel were removed in the laboratory and contained human cremains. These will be discussed in comparison to the scattered cremains from inside the tombs.

Baker, Lori [51] see Jones, Lauren

Baker, Sheldon [165] see Graham, Carole

Baker, Sheldon [149] see McAllister, Christine

Bakke, Gwen (Southern Methodist University)

[119]

The Aftermath of Colonization: Wichita Subsistence Change in the Southern Plains

European colonization of North America had profound impacts on Native American populations. These include the introduction of European diseases and warfare, the consolidation and abandonment of traditional lands, and the eventual forced relocation to reservations. Previously, much archaeological focus has been on the demographic, social, and political responses to European Contact. However, European colonization also greatly impacted traditional subsistence practices of Native Americans and has garnered far less attention. Changes in subsistence are important because they can be used as a measure to understand how Native Americans responded to European influences, the impact on their traditional lifeways, and potentially the relationship between Europeans and Native populations. This research presents preliminary results from a faunal study of the Upper Tucker site on the southern Plains, a site occupied by the Wichita and their ancestors in northeast Texas along the Red River during the period of European contact. This research examines the subsistence strategies at the site with a particular focus on how bison were utilized. The results of this study can contribute to archeologists understanding of potential changes, or continuity, in subsistence patterns in response to European occupation and interaction on the southern Plains.

Bakke, Gwen [22] see Lupo, Karen

Balanzario Granados, Sandra

[223]

Datos arqueológicos del asentamiento de Dzibanché, Quintana Roo

Desde 1987 hasta la fecha actual, el Instituto Nacional de Antropología e Historia ha realizado exploraciones arqueológicas en el asentamiento prehispánico de Dzibanché. Exploraciones que han documentado un asentamiento integrado por cuatro grupos de arquitectura monumental: Grupo Principal de Dzibanché, Kinichná Tutil y Complejo Lamay, todos ellos conectados por una extensa red de sacbeob. Conjuntos monumentales integrados por espacios cívicos ceremoniales y áreas habitacionales. La secuencia de ocupación considera una temporalidad que inicia en el Preclásico Medio y continua hasta el Posclásico Tardío (300 aC-1400 dC).

[223]

Chair

Balanzario Granados, Sandra [223] see Estrada-Belli, Francisco

Balanzario Granados, Sandra [223] see Viskanta Khokhriakova, Sandra

Balcarcel, AnaBeatriz (Mirador Basin/FARES Foundation)**[163]**

Temas eternos, datos nuevos de arquitectura ritual: La cancha para juego de pelota de Tintal, Cuenca Mirador, Petén, Guatemala
Las canchas para juego de pelota han estado presentes en Mesoamérica desde el período Preclásico. Su complejidad se manifiesta desde las diferentes variantes en su forma, temporalidades y dimensiones. Durante la temporada 2014 se tuvo la oportunidad de excavar una de las canchas preclásicas más grandes de las tierras bajas mayas y, en esta ponencia, se expondrán datos relevantes sobre la arquitectura, su asociación con otros edificios importantes en la traza urbana, así como sus principales hallazgos.

Balcarcel, AnaBeatriz [163] see Hansen, Richard

Balco, William (University of North Georgia)**[254]***Meaningful Engagement on a Shoestring Budget in North Georgia*

Engaging students, landowners, the public, and policymakers in the scientific process of archaeology is an essential component of our discipline and creates opportunities to impress upon these groups the value of historic preservation. Doing so demonstrates that archaeological and historic resources are limited and fragile, affording professionals the opportunity to emphasize the at-risk nature of many of these resources while also raising awareness of the diversity of local cultural heritage. Many institutions, particularly in today's socio-political and economic climate, may struggle with ways to fulfill the need for public engagement on limited funds. This paper presents various low-budget and collaborative efforts to engage others in the process of archaeology, from research design to excavation, artifact processing and analysis, report writing, and the final dissemination of results. Four engagement-minded archaeological projects from north Georgia's piedmont are discussed, serving as case studies of low-budget, high impact engagement strategies.

Balco, William [169] see Kolb, Michael

Baldwin, Dennis [206] see Garrison, Thomas

Balée, William [161] see Rocha, Bruna

Balicki, Joseph (Commonwealth Heritage Group) and Susan Malin-Boyce (USACE, St. Paul District)**[132]***The Rediscovery and Restoration of Arlington Cemetery's Ord-Weitzel and Sheridan Gates*

In 1879, the War Department building next to the White House was demolished. In 1814, masons who rebuilt the White House carved the building's columns. General Montgomery C. Meigs repurposed six of the columns from the north portico of the building as gateways through the original cemetery boundary wall at Arlington Cemetery. Meigs viewed the gates as lasting symbols of the nation's military. Meigs stated, "These historic columns, among which have moved the chief soldiers of the Army and the chiefs of the War Department during the last sixty years, and they have furnished very handsome gates to the principal cemetery [of the United States]." A cemetery expansion in 1971 included removal of the gates, but most elements were stored outdoors in an unused part of the cemetery. Beginning in 2012, the U.S. Army Corps of Engineers Mandatory Center of Expertise for the Curation and Management of Archaeological Collections (MCX CMAC), Saint Louis District (Corps) under the direction of Sonny Trimble, has led the efforts to rediscover and restore the gates. Once restored, these original gates will be incorporated into the modern cemetery expansion bridging memorial landscapes and furthering Meigs's enduring vision.

Ball, Christopher (University of Toronto)**[231]***Collaboration in Collections-Based Archaeology*

This paper discusses the growing importance of collections in archaeological research and addresses both the opportunities and challenges afforded by the integration of datasets obtained from a variety of sources such as museum collections, cultural resource management (CRM) firms, and academic excavations. In light of the rate at which cultural resource management firms have been able to excavate vast quantities of new data, it has become critically important that researchers from a variety of professional contexts begin making greater efforts to keep up with increasing rates of archaeological dataset production and ensure that the vast wealth of CRM excavated datasets and museum collections are not neglected in pursuit of additional excavation. Doing so, however, is often easier said than done. As such, with specific reference to my own work in southern Ontario, this paper will discuss the various idiosyncrasies and challenges of working with collections obtained from a variety of different sources, advocate for a greater degree of standardization in archaeological sampling strategies, and explore the ways in which the establishment of more robust relationships among researchers at academic institutions, museums, and CRM firms alike may feasibly make collections-based research a much more accessible endeavor.

Ball, Joseph (San Diego State)**[126]***Potting and Polychromy at Late and Terminal Classic Buenavista del Cayo, Belize: What NAA and Archaeology Say of What Was and Was Not*

Since 1993 there have been repeated references in the literature to possible "pottery making" at the Classic period Belize Valley center of Buenavista del Cayo. In reality, there is scant evidence to support actual pottery manufacture at the site, but, there is

ample support for the decorative painting, individualized detailing (with "Maya blue"), and final refiring of Guajiro Variety Cabrito Cream-polychromes within the center's palace. These two propositions (no fabrication, but painting and finishing) are supported both by ceramic and artifactual evidence, and the NAA findings of Ron Bishop's long term investigation of the production and circulation of Classic period Maya polychromes. This paper reviews the pertinent archaeological ceramics and NAA data supporting the absence of actual pottery fabrication at Buenavista, and the probable small-scale painting and second firing of red and orange-red on cream-slipped earthenwares within the center's palace in the early ninth century AD.

Ball, Kaitlyn (University of Massachusetts, Boston)

[80]

Archaeology of Health and Medicinal Practices in Plymouth Colony, Massachusetts

The exchange of medical knowledge and practices provides insight into the challenges of everyday life in the New England colonial era, specifically in scenarios where this exchange could have meant life or death. This project analyzes how the exchange of medical practices and knowledge between the colonists of Plymouth and the Native community can be examined in the archaeological record. Recent research shows how botanical remains may provide missing data on medicinal exchange and answer broader anthropological questions about culture contact. Artifactual and botanical remains are key because they complement documentary records and provide an opportunity to see these practices in archaeological assemblages. Through the use of historical and ethnographic documentation, a model is constructed to test on existing artifact collections. The study of medicinal exchange is significant for building a richer, more inclusive understanding of the relationship, influence, and social interaction between colonists and Native people.

Ballenger, Jesse (University of Arizona), Dakota Larrick (University of Oklahoma) and Alexander Craib (University of Wyoming)

[103]

Type Name Dalton, a Knudsonian Perspective

The type Dalton is uniquely suited for a Ruthann Knudson perspective of range of variability, because it crosses the lines of style and function and gender that archaeologists have inferred from the form and context. This analysis concentrates on the variability of time, form, and use-related dimensions of things called Dalton throughout the U.S. Southeast and Midwest, a problem that she may appreciate. The type is common, but the effervescence, use, and mixed end of the type is not understood. The analysis is based on an Oklahoma-centric perspective, where the Ozark Mountains meet the prairie, but we discuss the wider technology and time-range of what people identify as the type.

Balsanelli, Alice [127] see Palka, Joel

Baltus, Melissa (University of Toledo)

[70]

Discussant

Baltus, Melissa (University of Toledo)

[272]

Mediating Powers, Negotiating Inequalities: Ecological Politics at Cahokia

The Native American city of Cahokia originates in the creation of a cosmologically powerful landscape formed by the gathering of human and other-than-human participants (including earth, water, and fire) (see Pauketat 2013). At this center humans and their non-human partners mediated relationships between Worlds (Upper, Middle, and Lower), often involving the gathering and manipulation of 'vibrant' (or potent) materials (after Bennett 2010) in everyday as well as domestic contexts. Here I consider how local variations of involvement in those negotiations or differential access to the means of engaging with other-than-human agents likely created social inequalities and internal divisions. Changing relationships between humans and other-than-human agents within the Cahokian landscape, including periods during which relations of cooperation and complementarity became points of conflict, seemingly created fractures along new and existing cleavage points (e.g., gender, kin group, sodality, neighborhood or local community). This paper explores unraveling networks of humans and other-than-human persons in the context of a major depopulation during the late twelfth century and reconfiguration of the political landscape of Cahokia during the thirteenth century. I consider evidence for environmental change as transformative of local relationships between humans and other-than humans within an animate landscape rather than causative of 'collapse'.

Bandy, Matthew (SWCA Environmental Consultants) and David Reinhart (SWCA Environmental Consultants)

[175]

Automated Identification of Archaeological Features in a Regional Lidar Dataset from Southeastern New Mexico

In 2014, the Carlsbad Field Office of the Bureau of Land Management acquired 372 square miles of high resolution lidar data in an experimental attempt to map archaeological features over a wide area of southeastern New Mexico. The features of interest were burned rock middens with a distinctive topographic signature. If successful, this effort would have had significant applications for the study and management of cultural resources in the region. A GIS-based "digital survey" approach to feature identification was attempted using human operators and false color visualizations. This was successful but was too labor-intensive to apply to a broad area. In the end only 51 square miles were studied, about 14% of the lidar data acquired. This presentation reports on efforts to develop automated computational methods that would permit feature extraction at regional scales with little labor input.

[175]

Chair

Banks, Kimball (Metcalf Archaeological Consultants Inc.)**[154]***Moderator***Banks, William (CNRS [PACEA laboratory]) and Philippe Lanos (CNRS)****[24]***An Application of Hierarchical Bayesian Modeling to Upper Paleolithic Archaeological Cultures in France between 32 and 21 cal ka BP*

Investigations of chronology play a key role in the majority of archaeological research endeavors and are particularly pertinent to examinations of culture-environment relationships, especially during periods marked by pronounced climatic variability. Rigorous evaluations of data and robust methods are necessary to reconstruct reliable chronologies, and this is especially true for periods associated with a relatively few radiometric measurements. Such is the case for the Upper Paleolithic archaeological record of present-day France from 32,000 to 21,000 cal BP. We use critically examined radiocarbon measurements from contextually secure archaeological contexts and employ a recently-developed method of Hierarchical Bayesian Modeling to reconstruct the chronology of archaeological cultures from the Middle Gravettian to the Badegoulian. This approach for constructing regional chronologies represents a significant improvement over methods employed to-date and takes into account all available radiometric data rather than only those from stratified contexts. These robust chronological intervals for each typo-technologically defined culture phase are compared to the Greenland ice core climatic record and a terrestrial paleoenvironmental record from Bergsee Lake (Southern Germany)—itself expressed in calendar years calculated with the same calibration curve employed in our age model—thereby permitting each archaeological culture to be correlated accurately with documented paleoclimatic variability.

Bankuti, Natalie**[164]***Emblems of Authority: A Comparison of Preclassic and Classic Maya Inscribed Jade Artifacts*

In antiquity, the use of prestige objects and adornment made of jade was a key aspect of Maya elite life which carried over from the Preclassic to the Classic period. The establishment of jade indicating high social status has shown to have begun in Mesoamerica with the Olmec, however the scope of this paper will focus only on the 1,800-year span of time represented by the artifacts being studied; roughly spanning from 1000 BCE to 800 CE of the Gregorian calendar. Among these prestigious jade artifacts, some are inscribed with hieroglyphic writing which can, despite many of the glyphs remaining undeciphered, be of use to understanding aspects of royal life in the Maya world. While exact provenience and dating cannot always be calculated for every inscribed jade artifact, estimates provide enough context by which to compare them. These inscribed jade objects of adornment will be the focus of this paper and their forms, archaeological context, and glyphic messages will function as lenses by which I compare the usage of prestige material culture across the Maya elite from the Preclassic and Classic periods of the ancient Maya civilization.

Banning, Edward [55] see Hitchings, Philip

Bao, Qingchuan [199] see Zhao, Chao

Baqueda, Elizabeth (UCL Institute of Archaeology)**[225]***Decapitation and the Vulnerable Nature of Joints among the Aztecs*

Prisoners of war were ritually killed by heart extraction and they were often decapitated. Archaeologists at Templo Mayor found skulls with the first cervical vertebrae attached, indicating death by decapitation. Lethal weapons such as flint sacrificial knives were also found near decapitated individuals. Skulls were also placed in front of the Coyolxauhqui monolith discovered in 1978. Severed limbs and heads point to the vulnerability of joints, a concept also confirmed in several myths and graphically represented in the Coyolxauhqui sculptures, and in a variety of other deities and material objects.

Barba, Luis (Universidad Nacional Autónoma de México), Jorge Blancas (Universidad Nacional Autónoma de México), Agustín Ortiz (Universidad Nacional Autónoma de México), Ricardo Cruz and Sarah Clayton (University of Wisconsin-Madison)**[133]***Geophysical Studies in the Archaeological Site of Chicoloapan, State of Mexico*

In this paper, we present integrated archaeological and prospection data from the settlement of Chicoloapan, State of Mexico, generated by aerial photo, topographic survey, electric, magnetic, and georadar techniques. These data result from three years of research by the Proyecto Arqueológico Chicoloapan Viejo, a collaboration between UNAM and the University of Wisconsin-Madison that investigates the local impact of Teotihuacan's decline and the growth of an Epiclassic town. The site includes several visible mounds that appear on the surface to be isolated, but we know now that they were part of large architectural complexes that include the mounds, sunken patios, plazas, and surrounding residences. Sunken patios are well preserved since they remained beneath the plow zone. Architectural remains located close to the surface have been altered by modern mechanized agriculture, but we have been able to detect the buried remnants of walls and plastered floors of large, multi-room structures. Some of these structures incorporated volcanic stones, making it possible to detect them mainly through magnetic studies. After covering 50,000 m² by geophysical methods, we have a clearer understanding of the architecture present at Chicoloapan and can better characterize the relationship between visible mounds and other kinds of civic and residential structures.

Barba, Luis [20] see Alonso, Alejandra

Barbel, H  lo  se [50] see Woollett, James

Barber, Sarah [189] see Joyce, Arthur

Barciela, Virginia [25] see Coltofean-Arizancu, Laura

Bardolph, Dana (Northern Illinois University)

[1]

What Is at Stake in Archaeological Knowledge Production

Recent years have witnessed a sea change in anthropological discourse concerning how gender bias and a lack of diversity has affected the work that archaeologists produce, interest that dovetails with current concerns about equity and safety issues. More broadly, scholars in feminist, queer, and Indigenous studies also have questioned the particular frameworks of objectivity upon which science stakes its privileged access to knowledge. In this paper, I reflect on my own recent research and that of other scholars on the production and dissemination of archaeological knowledge through the gendered dimensions of publication, grant writing, and conference presentations. Who gets to write the predominant narratives of archaeology? Whose voices are elevated and whose are diminished? This prerogative decides the gatekeepers of our field—those who get to determine the prevailing narratives of our human past. A reflection on these issues and the inclusion of women and underrepresented groups in the narrative of archaeology (and science more broadly) are crucial if we want new questions asked and different perspectives on how best to answer existing ones.

Bardolph, Dana (Northern Illinois University), Gregory Wilson (University of California, Santa Barbara) and Duane Esarey (Dickson Mounds Museum)

[211]

Religion, Culture Contact, and Mississippian Origins: A View from the Illinois Valley

Remote sensing and two years of excavation at the Fandel site, near Upper Peoria Lake in west central Illinois, are shedding new light on the complicated history of population movement and culture contact that fueled the origins of Mississippian society in the American Bottom and the Illinois River Valley. This ongoing research has revealed construction and use of early Mississippian platform mounds, elaborate ceremonial buildings, and rituals central to Cahokia's mid-eleventh century urban intensification and its simultaneous integration with outlying contributory groups at strategic points across the upper Mississippi River basin. These findings have the potential not only to better elucidate the dynamics of culture contact during the Early Mississippian period across the greater Midwest, but also to reframe understandings of the social and spatial contexts in which various groups interacted and generated the transregional connections, beliefs, and practices that have come to define Mississippian culture.

Bardolph, Dana [72] see VanDerwarker, Amber

Barker, Graeme (McDonald Institute for Archaeological Research, University of Cambridge)

[171]

Discussant

Barket, Theresa (California State University, Bakersfield), Felicia De Pe  a (University of California, Berkeley) and Ahmad Thaher (Independent researcher)

[199]

New Insights from a Reanalysis of the Flaked-Stone Assemblage from the Neolithic Site of Wadi Shu'eib, Jordan

In the ongoing research on the Neolithic of the Southern Levant, flaked-stone assemblages continue to play a key role in interpretations of social organization and interaction. Despite the prominence of research on lithic assemblages during the Neolithic, few comprehensive studies come from the large settlements with long, continuous occupation spans (2,000 years of continuous occupation) that are likely to be more informative about long-term patterns of social and economic change. For instance, the research conducted at the long-occupied site of 'Ain Ghazal, Jordan demonstrated that changes in the flaked-stone assemblage correspond with changes in subsistence, settlement size, and settlement configuration through time. If such patterns exist at other similar sites with long occupation spans, it remains understudied. Therefore, this research aims to address these shortfalls in our knowledge through additional analysis on the flaked-stone assemblage from the site of Wadi Shu'eib, a large Neolithic settlement in Jordan occupied from the Middle Pre-Pottery Neolithic B to the Pottery Neolithic. Specifically, this paper presents the results of a technological analysis of a sample of debitage, cores, and tools from each period of occupation and interprets what they may tell us about socioeconomic change through time at the site of Wadi Shu'eib.

Barkwill Love, Lori (University of Texas at San Antonio)

[135]

Modeling the Early History of Maize in the North American Southwest

Although originally domesticated in Mexico, the initial adoption and spread of maize (*Zea mays*) are fundamental to understanding the transition from foraging to farming in the North American Southwest. This study uses multiple statistical analyses on over 500 radiocarbon dates acquired on maize macrobotanicals from 60+ Archaic sites to model the introduction, dispersal, and intensity of

early maize use in the North American Southwest. To examine the timing of the introduction and dispersal of early maize, Bayesian chronological models are constructed based on site elevation levels and by ecoregions. Kernel density estimation (KDE) models and cumulative probability distribution (CPD) models are used to examine the distribution of maize to infer the intensity of maize use during the Archaic period. In addition, the results of the KDE models are compared to paleoenvironmental reconstruction datasets to examine the relationship between maize usage and climate change. This study highlights the use of multiple perspective chronologies to address large-scale issues, such as the adoption and spread of agriculture.

[135]

Chair

Barkwill Love, Lori [122] see Whisenhunt, Mary

Barland-Liles, David (Law Enforcement)

[49]

The Power, Process, and Practicality of Tribal Monitoring of Federal Criminal Investigations

The Federal Rules of Criminal Procedure provide a mechanism for investigators, prosecutors and Tribal representatives to build a relationship of trust that facilitates equitable efforts associated with truth finding and resolution of criminal matters. In 2016 the U.S. Attorney's Office successfully prosecuted a former manager of Effigy Mounds National Monument who committed and covered up a heinous crime designed to circumvent the provisions of the Native American Graves Protection and Repatriation Act. A special agent, 20 sovereign nations, and the U.S. Attorney's Office used these procedures to become united and powerful protectors of justice and civil rights. This procedural application had never been attempted before.

Barlow, Robert (University of Wyoming)

[198]

Hunter-Gatherer Behavioral Response to the Younger Dryas in North Alabama

This collections-based study uses approximately 1,300 projectile points from north Alabama to investigate behavioral responses to the Younger Dryas climatic event (12,900 to 11,700 BP). A modified version of the marginal value theorem is applied to determine how changing resource structures affected hafted biface technology. I argue that variation in design and curation of hafted bifaces during and after the Younger Dryas was not conditioned by access or availability of lithic raw material. Instead, observed variation is a behavioral response to changes in return rates from hunting and foraging. Further, the changes in hunting return rates are affected by changes in north Alabama forest structure, which were conditioned by climatic changes brought on by the Younger Dryas. To this end, I argue that the sustained impact of the Younger Dryas, and subsequent Holocene warming, had an effect on the subsistence economies of hunter-gatherers living in northern Alabama during this time, which is exhibited by changes in hafted biface technology.

Barnard, Hans [240] see Edington, Stacy

Barnard, Hans [252] see Iizuka, Fumie

Barnard, Hans [268] see Simborth, Erika

Barnett, Kay [149] see Hovezak, Tim

Barnett Tankersley, Kenneth [63] see Herzner, Louis

Bar-Oz, Guy [159] see Vaiglova, Petra

Barrera, Jimmy (U.S. Army Corps of Engineers)

[256]

Case Example of Permit Compliance to Public Outreach, New Braunfels, Texas

The U.S. Army Corps of Engineers' (Corps), Regulatory Program evaluates activities that require Department of the Army authorization under various legislative authorities including Section 404 of the Clean Water Act. This presentation will summarize the Corps' regulatory involvement with a project located in New Braunfels, Texas. A project overview and summary will be included on the historic and prehistoric resources. This will be followed by architectural and archeological mitigation which involved public outreach. The public outreach efforts included: live weekly webcasts on various topics, project website, social media posts, blog entries, daily site tours including Saturday, special evening programs, working with local volunteers, and a constant team effort to promote the project. While the Corps' role in this project is regulatory and review, the implementation and ideas for this project are owed to the Permittee and their quality team. Finally, this project received a public outreach award and the outreach model has been utilized in other regional projects.

Barrett, Sophia (Skidmore College), Samantha Mackertich (Skidmore College) and Kathryn Baustian (Skidmore College)

[35]

Reassessing Demography of the Bronze Age Tomb at Tell Abraq (UAE): Using Multiple Bone Elements from a Commingled Context

A circular stone tomb at the site of Tell Abraq (UAE) on the southern coast of the Arabian Gulf was used as a mortuary feature for approximately 200 years (2200–2000 BC) during the Bronze Age. Both adults and children were buried in the six-meter wide tomb,

causing significant admixture or commingling of the remains. This research reassessed the demography of the children and infants in the tomb by analyzing bones of the arm (humerus and radius) for comparison to previous data from the leg (right femur). Results showed similar age distributions with high rates of mortality for newborns and infants under two years of age. Data from the left humerus and right radius were able to account for seven additional subadults in the tomb, bringing the total minimum number of individuals (MNI) to 134 subadults. The demography presents opportunities for further investigation of morbidity and mortality factors among a commingled skeletal assemblage.

Barrientos Q., Tomás [223] see Stuart, David

Barron, Aleese (Australian National University) and Tim Denham (Australian National University)

[235]

The Use of MicroCT Imaging for Archaeobotanical Investigations

MicroCT imaging has the potential to extract new archaeological information from existing archaeobotanical collections as well as create new archaeobotanical assemblages within ancient ceramics and other artifact types. The technique can aid in answering archaeobotanical questions in regions with poor archaeobotanical preservation and where ancient plant exploitation remains poorly understood. This paper will outline current and potential uses of microCT imaging in the investigation of archaeobotanical questions, including the analysis of organic remains preserved within pottery sherds and the identification of archaeological parenchyma. Issues to be discussed include analytical coverage, image resolution, sample preparation, data management, access to facilities, data hosting, as well as methodological limitations.

Barry, Patrick [9] see McDaid, Chris

Barth, Nicolas [102] see Stanton, Travis

Barton, Loukas [236] see Brady, Ryan

Barton, Michael [226] see Bergin, Sean

Barzilai, Rebecca (Illinois State Archaeological Survey)

[264]

The Traditional and the Novel in Material Practice: Nuancing Our Understanding of Ritual Activities at the Emerald Acropolis through Compositional Studies of Ceramics

The Emerald Acropolis sits at the edge of the historic Illinois prairie on an aboriginally sculpted ridge visibly high in the landscape at the eastern extent of Greater Cahokia. The site is located 24 km east of the central precinct of the Ancient Indian city which itself is situated on the east side of the Mississippi River near modern St. Louis. Defined as a lunar shrine complex where intermittent occupation and activities by local and non-local visitors produce novel ideas, cultural expressions, and material remains, the activities at Emerald have implications for the origins of Greater Cahokia and the larger region circa AD eleventh to thirteenth centuries. This study looks at the ceramic material practices associated with the ritual activities of the people of Greater Cahokia, the visitors to this religious center, and the ways in which these material practices shifted and changed through these interactions; curating or retiring the traditional and producing the novel in style and material practice. I will look at the vibrancy of material affects and how these affects and relationships impact/are impacted by human relationships to landscapes and storied geologies to trace the cultural innovations through the lens of the material sciences.

Basanti, Dil (Northwestern University)

[272]

Materializing Aksumite: Power Plays in the Location of the Northern Stelae Field (AD 100–400)

This paper looks at how the location of the central stelae field in Aksum (in use from ~ AD 100–400) took advantage of natural features to amplify indigenous ideologies. The Northern Stelae Field is the burial location of the most powerful Aksumites, and tradition dictates that at least some were kings. The stela field is uniquely located to take advantage of four environment features: the central reservoir, a nepheline syenite stone quarry 6km away, and two mountains that flank the cemetery. Working together, the mountains create a light corridor that washes over the stela and emphasizes the unique properties of the granite stone in the early morning when most people would have accessed the reservoir. While this location is perhaps one of the worst in Aksum for the preservation of bones, it is perhaps one of the best placed to communicate powerful ideologies through the monumentality of stone. Mortuary practices indicate the stelae perpetuated ideologies of "Aksumiteness" and "localness" (over "foreignness"). Taken together, the combination of these different data demonstrate how the authors of the stelae used the landscape to maintain their positions of power as they became threatened by Aksum's intense globalization.

Bassett, Christine [237] see Voorhies, Barbara

Bastante Abuhadba, José [197] see Combey, Andy

Bateman, Mark [194] see Lawrence, Ken

Bates, Brian (Longwood University)

[228]

Improving STEM Competencies via Archaeology Research in the Staunton River Valley: An Introduction

Funded through a National Science Foundation–Improving Undergraduate STEM Education (NSF-IUSE) grant, the overarching goal of the project is to improve STEM competency among both STEM and non-STEM undergraduate students. The National Science Foundation has long recognized archaeology as a STEM discipline, although many students do not make this connection. This project is innovative in that it will engage students through field research in a subject they don't traditionally perceive as STEM, archaeology. In this way, the project will circumvent students' fear-based avoidance of STEM, thereby bridging the gap between non-STEM and STEM thinking and ultimately improving STEM competency. This paper will provide an overview of the research project as well as the initial steps undertaken.

Bates, Jennifer (University of Pennsylvania), Adam Green (University of Cambridge), Ravindra Singh (Banaras Hindu University) and Cameron Petrie (University of Cambridge)

[272]

Many Communities, Many Foods: The Economic and Political Implications of Diversified Cropping Strategies before, during and after Urbanism in Northwest India ca. 3200–1500 BC

Climate crises are raising questions about how we feed everyone in our highly urbanized modern society. Anthropological research has demonstrated that economic, political and environmental landscapes are intricately interwoven and intersect with the diverse choices of people across all scales of society. Nowhere is this clearer than in northwest India, where diverse cropping strategies have played a major role in the region's political ecology. Archaeology provides the tools to explore the *longue durée* of the economic and political impact of diverse agricultural strategies. In this paper, we will explore the economic and political implications of the exploitation of different agricultural systems. Over more than four millennia of social development and transformation, the use of different crops and cropping regimes facilitated different kinds of interaction at various scales, potentially at times alleviating the pressures brought about by increasing urbanization. For example, in the hinterland of Rakhigarhi, one of the region's first cities, farmers developed a variety of strategies to survive social and environmental diversity and change. These diverse multi-cropping strategies persisted, and were facilitated by social choices that may have favored interaction among rural small-scale settlements before, during and after phases of urbanism.

Battillo, Jenna (PaleoResearch Institute), Thomas Stafford Jr. (Stafford Research), R. A. Varney (PaleoResearch Institute) and Linda Scott Cummings (PaleoResearch Institute)

[66]

Radiocarbon, Deposition, XRF, and Pollen Records from Hall's Cave, Texas

Hall's Cave in south-central Texas contains well-dated sedimentary deposits from the Last Glacial Maximum (ca. 17 ka RC) to present. The Younger Dryas event easily observed here as a sediment change at 151 cm BD, divides the pre- and post-impact event records. The short interval (ca. 11,000 to 10,000 RC) examined for pollen and XRF signatures address the immediate pre- and post-impact event vegetation and depositional records. A microscopic charcoal spike (2,000% compared with pollen) recorded immediately above the impact event is accompanied by an abrupt vegetation change, suggesting response to fire. Large quantities of microscopic charcoal continue in the sediments for approximately 10 cm as the pollen record registers vegetative recovery marked by a typical early Holocene signature of elevated dandelion-type plants and large amounts of sagebrush. Subsequently, sagebrush declines and high-spine asters increase. Arboreal pollen frequencies remain lower than earlier. The XRF signatures for strontium/calcium ratios and quantities of zinc, iridium, and others are examined as part of the depositional history, which is delineated by 160 radiocarbon dates, 60% on bone collagen. We use complementary pollen, XRF, and radiocarbon analyses to address the deposition and vegetation records surrounding the purported impact event.

Batún Alpuche, Adolfo [57] see Dedrick, Maia

Bauer, Andrew (Stanford University)

[124]

Cultivating Problems and Constituting Publics: Fertile Fields and the Social History of the Medieval Deccan, Southern India

This paper addresses a long-standing historiographical trope about the social history and essential "fertility" of the Raichur Doab, a region of the central Deccan of southern India that was ostensibly contested by numerous imperial polities throughout the Medieval and Early Modern Periods for its rich agricultural resources. By triangulating the shifting locations of land use through analyses of intensive pedestrian survey results, multi-spectral remote sensing data, and medieval textual records, the paper demonstrates that agricultural production faced numerous social and material challenges in the region and suggests new lines of inquiry into how the doab and the diverse publics that were created through its contestation are imagined and theorized.

Bauer, Kimberly

[133]

Epiclassic Domestic Assemblage Variation at Chicoloapan in the Southeastern Basin of Mexico

Chicoloapan in the southeastern Basin of Mexico experienced a large amount of growth during the Epiclassic period, growing from a few hundred people to a large town of thousands, through a process of migration from unknown areas. In this paper, I discuss domestic assemblages from Early Epiclassic contexts and their variation across the site of Chicoloapan. Current knowledge of

Epiclassic household material culture is limited in the Basin of Mexico because extensive, stratigraphically controlled excavations of domestic contexts from this period have been rare. Previous studies of Epiclassic ceramics have focused on data from surface collected pottery or historic collections without contextual information. Ceramics from Chicoloapan are well preserved and from specific stratigraphic contexts, providing the opportunity to examine domestic assemblages in detail, which advances our comprehension of foodways, ritual activity, and variability among households.

Bauman, Natalie [37] see Anderson, Jennifer

Baumann, Laura [137] see Poister, Nicholas

Baumann, Tim [78] see McKenna, Kathryn

Baustian, Kathryn (Skidmore College)

[131]

What's Your Question? Theoretical Bioarchaeology in the American Southwest and Ancient Arabia

Bioarchaeology today is interdisciplinary, scientific, and theoretical. For over 30 years, Debra Martin has contributed substantially to archaeology by promoting these shifts in the discipline. Her scholarly accomplishments are extensive but I suggest that perhaps her most important contribution to the field of bioarchaeology has been her ability to train the next generation of scholars to ask meaningful questions about people in the past. Martin's philosophy is that large questions promote exploration of answers from a variety of data, methods, and perspectives. Using case studies from the Mogollon region of the American Southwest and Bronze Age Arabia, this paper exemplifies Martin's influence toward biocultural inquiry. Skeletal data from Grasshopper Pueblo and Mimbres sites are presented as examples of how violence and trauma may have varied interpretations. Data from the site of Tell Abraq (UAE) demonstrate the utility of asking broad questions to interpret morbidity and mortality from complicated skeletal assemblages. Research like this is more nuanced by theory and consideration of many perspectives and this is a direct reflection of Martin's publications, teaching, and mentorship. It is sure to continue in the decades to come as her students are now training the next generation in biocultural, data-driven, theoretical bioarchaeology.

Baustian, Kathryn [35] see Barrett, Sophia

Baxter, Carey (USACE ERDC-CERL), Heather Johnson (USACE ERDC-CERL) and Christopher McDaid (U.S. Air Force)

[256]

Confederate Earthworks on Fort Eustis, VA: 3D Digitalization as Alternative Mitigation and Public Outreach

The Yorktown-Warwick line was a series of defensive earth works constructed in 1861–1862 by the Confederate Army of the Peninsula to defend the Virginia Peninsula from attack from the United States Army. These earthworks played a key part in the 1862 Peninsular Campaign. Portions of these earthworks survive on the training lands of the Fort Eustis portion of Joint Base Langley-Eustis, VA. One of these sites, Fort Crafford, was listed on the NRHP in 1973. Proposed power line construction will impact the view shed of Fort Crafford. To mitigate these adverse effects, the United States Army Corps of Engineers, Engineering Research and Development Center, Construction Engineering Research Laboratory is combining lidar, Terrestrial 3D scanning and computer modeling to generate virtual versions of the earthworks as they currently are and as built. These models, when hosted online, will allow virtual public access to a site usually off limits to the general public.

Baxter, Erin (University of Colorado, Boulder / Denver Museum of Nature & Science), Michele Koons (Denver Museum of Nature & Science), Steve Nash (Denver Museum of Nature & Science), Deborah Huntley (Denver Museum of Nature & Science / Tetratex) and Octavius Seowtewa (Zuni Tribe)

[156]

Another Kiva in the Mix: The Toriette Lakes-Reserve Area Great Kiva in Context of Landscape, Chronology, History, and Function

The Toriette Lakes Great Kiva (near Reserve, NM, in the Mogollon highlands) was excavated in 2018/2019 under the auspices of the Denver Museum of Nature & Science and in collaboration with the Gila National Forest and cultural advisors from the Pueblo of Zuni. Half of the structure was excavated and systematic surveys (including remote sensing) were conducted around the site. This paper explores our findings and interprets this kiva within the context of broader Mogollon and ancestral Pueblo architecture and chronology. Because the kiva is located at about 7,500 feet within a dispersed community, we also examine high-altitude subsistence adaptations, community organization, and historical precedents for regional research in the vicinity.

Bayarsaikhan, Jamsranjav [62] see Égüez, Natalia

Bayarsaikhan, Jamsranjav [62] see Taylor, William

Bayman, James

[255]

Integrating Top-Down and Bottom-Up Perspectives on the Ancient Southwest

Emerging efforts in anthropological archaeology to integrate "top-down" and "bottom-up" perspectives were foreshadowed by Alan Sullivan's provocative research agenda. His investigations of ceramic technology, subsistence economy, and land-use challenge long-standing assumptions that hinder the development of defensible insights on the ancient Southwest. This presentation offers a

suite of vignettes to illustrate the integrity of his novel and unyielding approach to archaeology.

Bazán Pérez, Augusto (Fundacion Augusto N. Wiese)

[197]

Reevaluando la Historia Ocupacional de Pampa de Llamas-Moxeke, Valle de Casma

El sitio de Pampa de Llamas-Moxeke, tradicionalmente asignado al Periodo Formativo Temprano (1800–1000 aC), ubicado en el valle de Casma, viene siendo investigado nuevamente luego de las últimas excavaciones desarrolladas en la década de 1980. Nuevos datos generados a partir de las nuevas investigaciones en sectores antes no explorados, además de evidencias provistas por otras investigaciones dentro del valle y alrededores, sugieren fuertemente que el complejo tiene más ocupaciones que las originalmente propuestas. De esa forma, se plantea una historia ocupacional más antigua que lo previamente determinado, con implicancias en el tránsito precerámico-cerámico en los Andes Centrales.

Beach, Sonya (Open Range Archaeology), R. Doyle Bowman (Open Range Archaeology), Thomas Thompson (Open Range Archaeology), Thomas Gruber (Open Range Archaeology) and Janna Gruber (Open Range Archaeology)

[193]

CRM and Public Outreach: Relationship Goals

Archaeologists should be ambassadors of the discipline, giving responsible access to shared history with other disciplines and members of the public. As Cultural Resource Management (CRM) archaeologists, our autonomy, varied knowledge, and specialized equipment allow us opportunities to perform a public good, whether in the form of speaking to schools, conducting remote sensing surveys in cemeteries, writing NRHP nominations, performing photogrammetric research for heritage sites, creating illustrative hand-outs, maintaining a social media presence, or continuing research on a site for a landowner. CRM archaeologists can contribute to public outreach in a number of meaningful ways utilizing diverse methods, tools, and scales of outreach. While the primary focus of CRM companies must be success in the industry as a business, public outreach also allows CRM archaeologists to reconnect with their passion for the discipline and develop skills that can translate to the commercial sector.

[193]

Discussant

[193]

Chair

Beach, Timothy (University of Texas, Austin), Samantha Krause (Texas State University) and Sheryl Luzzadder-Beach

[59]

Going Back to the Trowel: Wetlands, Resilience, and Climate Change in Maya History

One of the important contributions that archaeology can make to environmental change is to show local and regional examples of human impacts and responses to environmental changes. Excavations can show the stratigraphic manifestations of such changes and direct evidence of how humans adapted. This paper outlines these effects and adaptations we interpret from decades of multiple proxy wetland excavation. We focus on three changes associated with climate change: human impacts on climate, drought, and water table rise. The wetland complexes in northwestern Belize became wetlands as sea level rose over the late Holocene and humans built canals to reclaim their maize and polycultural agroecosystems. These wetland-farming systems also overlap with growing evidence for two periods of drought in the Late Preclassic and Terminal Classic. The explosion of lidar now greatly increases our ability to test these connections by providing big data about water management features but we still must go back to the trowel—local manifestations—to explain their chronological connections to drought and beginnings of the Early Anthropocene.

Beach, Timothy (University of Texas, Austin)

[90]

Discussant

Beach, Timothy (University of Texas, Austin)

[219]

Discussant

Beach, Timothy [8] see Casal, Fernando

Beach, Timothy [206] see Donn, Leila Beach, Timothy [230] see Doyle, Colin

Beach, Timothy [206] see Eshleman, Sara

Beach, Timothy [14] see Krause, Samantha

Beach, Timothy [230] see Smith, Byron

Beamer, Dawn (University of Connecticut), Lisa Park Boush (University of Connecticut), Mary Jane Berman (Miami University), Perry Gnivecki (Miami University) and Amy Myrbo (University of Connecticut)

[59]

Climate and Culture in the Caribbean and Western Atlantic Regions: An Update

The islands of the Lesser and Greater Antilles were permanently settled as early as 8000 ybp but the earliest known human presence in the Bahama Archipelago is dated ~1300 ybp, some 6,700 years later. Current literature suggests that climate variations in the Caribbean/West Atlantic region may be a key to understanding the timing of migration, colonization, and some aspects of culture change in the Bahamas. Periodic climatic fluctuation in the Caribbean/Western Atlantic follows similar trends when observed at a millennial resolution; however, at multi-decadal and centennial scales, the timing and location of precipitation and temperature regimes vary. Climate proxies such as Fe, Sr:Ca, Ca and $\delta^{18}\text{O}$ from the Caribbean/Western Atlantic show if and how climate may

have co-varied between the islands of the region. We have synthesized a body of high-resolution paleoclimate records to provide a framework that can be used to view Lucayan resource procurement, trade and exchange, settlement patterns, and sociopolitical relationships around the time of the Medieval Climate Optimum. Here we present new results from Eleuthera Island and San Salvador Island, Bahamas, including an updated age model, as well as carbon and nitrogen isotope datasets from lake and terrestrial sediments.

Beardsley, Michael [190] see Lothrop, Jonathan

Beaudoin, Alwynne (Royal Alberta Museum)

[103]

Points, Ponds, and Palaeoecology: Almost 60 Years of Study at the Fletcher Site (DjOw-1) in Southern Alberta

Ruthann Knudson had a career-long interest in Paleoindian archaeology, especially point typology. As such, points from the Fletcher Site (DjOw-1), on the northern Great Plains in southern Alberta, attracted her interest, as seen in a fine drawing she shared with me in 2009. This well-known site was discovered in early 1963 by Armin Dyck, a local avocational archaeologist. Richard Forbis undertook test excavations in 1963, identifying a bone bed with Paleoindian points. Further excavations, studies, and site visits have occurred at intervals between 1964 and 2012, with substantial excavations in 1987 and 1988. The Cody-complex level at about 2 m depth has yielded bison bone, as well as seeds (*sensu lato*), mollusc shells, bird's egg-shell, and faunal remains from fine-fraction analysis of the matrix. Since 1987, my research has focused on these macroremains, identifying more than 33,000 seeds and 79,000 mollusc specimens, mostly from wetland and aquatic taxa. Calibrated radiocarbon dates from seeds suggest an age of about 10,600 cal yr BP. Data synthesis indicates a perennial, perhaps slightly brackish, water body, in an early Holocene landscape distinctly different from today's. As it was for Ruthann, the site continues to be a focus of interest in Paleoindian archaeology.

Becerra-Valdivia, Lorena [68] see Koenig, Charles

Beck, Charlotte [253] see Jones, George

Beck, Jess [35] see Hayes, Vivienne

Beck, Margaret [35] see Priola, Victoria

Becker, Hilary (Binghamton University), Julia Sullivan (Binghamton University) and Crae Wilkins (University of Iceland, Háskóli Íslands)

[234]

Pricing the Painted Walls: Reconstructing the Cost of Roman Pigments in Use

While Pliny the Elder recorded the prices for some pigments, these prices may not easily translate into an understanding of the real costs of painting without considering the scientific properties of these materials. As some aspects of the ancient industry of Roman wall painters are lost to us, it is helpful to test scientifically the wisdom received from ancient authors. A Roman account of pigment prices records that cinnabar (mercury sulfide) could cost 35 times more per pound than red ochre. When looking at the choices made by patrons and painters, the use of cinnabar seems to be a prestigious and expensive color. A recent study, using experimental archaeology, reveals that the real material cost of cinnabar was more expensive than an ancient price listing alone might reveal. In particular, what provoked this study was the knowledge that not all pigments are equal in their volume. Experimental frescoes were painted using equal volumes of cinnabar and red ochre to explore what the cost and coverage (per pound) of each color truly was. By learning more about the scale of materials and relative costs, such an inquiry serves to flesh out the chaîne opératoire of Roman painting.

Becker, Janee

[213]

The Wigwam: Archaeological Investigations and Historical Interpretation of Native American Wild West Show Performer Campsites in Clearfield County, Pennsylvania

The DuBois Wigwam Project investigates the historic context and significance of twentieth-century Native American performer campsites in western Pennsylvania through the documentation and excavation of the area surrounding the former home of Major Israel McCreight, known as the Wigwam. The Wigwam was built in 1906 and served as a camp for Buffalo Bill's Wild West Show, and a haven for visiting Native Americans. Aside from Buffalo Bill Cody, Major Israel McCreight often hosted chiefs Flying Hawk and Iron Tail and was considered a life-long friend of Native Americans. Investigations for this project attempt to locate features related to historic Native American performer campsites using background research, metal detector survey, magnetic gradiometer survey, and test unit excavation. Data collected through these investigations address the adaption and resiliency of Native American's during the period of 1906 through 1913. This research explores the pressures of this time-period on Native American lifeways and how they influenced Native American performer identity.

Beckham, Christopher [83] see Carlson, Meredith

Beggen, Ian (University of Michigan)**[67]***Predictive Modeling and the Identification of Terminal Pleistocene / Early Holocene Sites in the Andean Highlands*

Despite increasing research attention, debate continues regarding the timing, duration, and nature of Terminal Pleistocene (TP) / Early Holocene (EH) occupations in the Andean highlands (>2500 m). Disagreement stems in part from seemingly contradictory evidence from a relatively small number of early highland sites. Increasing our sample size is key to answering longstanding questions regarding human adaptations to high altitudes, but common survey methodologies are poorly suited to identifying the full range of prehistoric activities in the Andes during the TP / EH. This pilot study compares and evaluates a variety of survey methods, centering on predictive modeling (e.g., geographical/distance analysis, multivariate statistical methods) and its potential for improving our ability to identify and test TP / EH sites from across the tremendously diverse Andean landscape. Specifically, I test the efficacy of different methods of predictive modeling through a review of the models' previous applications in the literature and by evaluating the ability of different models to identify sites on a simulated archaeological landscape. This elucidation of the most efficient and effective means of identifying sites will help to resolve current debates regarding early use of the Andean highlands and ultimately improve our understanding of human adaptive capabilities.

Begley, Chris [77] see Wann, Kevin

Behm, Jeffrey [82] see Crass, Barbara

Behrens, Anja [107] see Lueth, Friedrich

Belardi, Juan (Univ Nac de la Patagonia Austral), Silvana Espinosa (CONICET - Universidad Nacional de la Patagonia Austral), Luis Horta (CONICET - Universidad Nacional de Tucumán) and Flavia Carballo Marina (Universidad Nacional de la Patagonia Austral)**[67]***The Quarry in the Forest. The Case of the Upper Guanaco River (Southern Patagonia, Argentina)*

Hunter-gatherer forest landscape use is an ongoing discussion in Southern Patagonia. The recent finding of a silicified rock quarry on the upper Guanaco River (close to the Andean range) adds important data to the debate focused on forest intensity use and it is useful to model forest-steppe interaction. The quarry, located in the western flank of a hill, in middle of the Nothofagus forest, has several levels of silicified rock (0.3–0.6 thickness) with flintknapping evidence. In this vein, workshops and rock hammers were found with an association that was strictly spatial. From a regional biogeographic frame, the quarry could only be used during late spring and summer. We propose an intense but spatially restricted use and this evidence helps to rank the marginality of forest lands for hunter-gatherer populations in a supraregional scale.

Belcher, Megan (University of Tennessee), Daniel Williams (Ohio State University) and Natalie Mueller (Washington University, St. Louis)**[78]***Testing the Soil Preferences of Erect Knotweed (Polygonum erectum) in a Common Garden Experiment*

Before the cultivation of maize, a unique crop system of plants was cultivated and domesticated by farmers in precolumbian eastern North America called the Eastern Agricultural Complex (EAC). Though known archaeologically, important questions about how these crops were grown, consumed, and shared among past peoples remain largely unanswered. For example, ideal soil conditions for different EAC crop cultivation is unknown. Preferences for certain soil types by these crops could have played a role in where and how past peoples interacted and moved on the landscape. This poster explores cultivation practices favored by one crop species, erect knotweed (*Polygonum erectum*), through growth experiments. Results indicate that populations of *P. erectum* grown in rich, well-drained soils grew faster and larger than those in clay-rich soils. This information contributes to our understanding of EAC crop cultivation and that illustrates that factors, like crop soil preference, could have influenced ancient farming practices and settlement patterns.

Belcher, William [188] see Jamison, Gregg

Beliaev, Dmitri (Knorozov Mesoamerican Center, Russian State University for the Humanities) and Simon Martin (University of Pennsylvania Museum)**[223]***"Serpent Emperor": The Reign of K'ahk' Ti' Ch'ich' and the Origins of Dzibanché Hegemony*

Recent studies of the inscriptions related to the Kaanul dynasty has revealed a new ruler named K'ahk' Ti' Ch'ich'. He is mentioned in various Maya sites (El Peru, Uaxactun, Naranjo) as a high king and overlord with a wide dominion. His accession in 550 CE is recorded on the wooden Lintel 3 from Dzibanché, and is referred to as "seating as kaloomte." As far as we know, K'ahk' Ti' Ch'ich' is the earliest Kaanul ruler to used this supreme Classic Maya title. A reexamination of the text of Altar 21 from Caracol reveals the name of K'ahk' Ti' Ch'ich' and suggest the possibility that it was he who defeated Tikal in the famed star war event of 562. He appears to be associated with a later date, in 570 or 571, which indicates that his reign was not so short as previously believed. In the paper we summarize the data that demonstrate that K'ahk' Ti' Ch'ich' consolidated the political success of his predecessor Tuun K'ab Hix and made Dzibanché the capital of the largest hegemony in the Maya World.

Beliaev, Dmitri [130] see Vepretskii, Sergei
 Beliaev, Dmitri [223] see Viskanta Khokhriakova, Sandra

Belisle, Veronique (Millsaps College), Aleksa Alaica (University of Toronto) and Matthew Brown (University of Michigan)
[61]

Private and Public Consumption: Considering Diet and Social Inequality at the Middle Horizon Site of Ak'awillay, Cusco, Peru
 Cuisine can reflect everyday practice and the availability of specific ingredients. However, cuisine can also represent choices made about what is served and consumed in public and what is kept private. In addition, the way that diet persists or changes through time can be an indication of internal transformations as well as external pressures. At the multi-component site of Ak'awillay in the Cusco region of Peru, faunal remains and ceramic vessels indicate diachronic shifts in diet in the Early Intermediate period (200–600 CE) before the expansion of Wari influence. In the Middle Horizon, public spaces have large amounts of camelid meat and serving vessels for feasts, while in houses more exotic species are present that may have been part of smaller-scale special meals. We argue that the way in which local elites were sharing food in public spaces during large consumption events was a mechanism for maintaining community cohesion among families, labour groups, and trade partners. This public impression was paired with private dietary choices that involved the importation of exotic species to feed the power struggle connected to the ability to afford and show access to restricted products.

Bellia, Angela
[25]

Aural Experiences in the Performative Spaces of the Past

The aural experience is a fundamental process in the development of human beings, which is shaped by architecture and the environment. Sensory experience has rarely been considered in the study of public spaces in antiquity. As Barry Blesser and Linda-Ruth Salter pointed out, aural architecture is that aspect of real and virtual spaces that produces a sensorial and behavioral response in inhabitants. For example, a performative space in antiquity related to a sanctuary can produce feelings of connectedness. This paper aims to investigate new insights of antiquity's sounds and sights in a performative space. Furthermore, this paper will explore the visual and acoustic experiences in the performative spaces "as sensory artifacts", developing a new theoretical basis and linking digital heritage and acoustical techniques. Through the acoustic analysis of particular case study in Italy, this paper will intend to explore a new approach to the development of the relationship between space, sound, and environment and a novel method to decipher geophony, biophony, and anthropophony, as a sort of "sonic fabric" of the performative spaces and their immediate surroundings, taking into account the relationships between the different and interactive sonic components of a landscape, thanks to digital technology.

Bello, Charles (Federal Emergency Management Agency (FEMA-DHS))
[97]

Introduction to Session and Some Case Studies

Introduction to the session of "Collaboration and Community Involvement in Archaeology," including case studies.

[97]

Chair

Bello, Charles (Federal Emergency Management Agency (FEMA-DHS))

[154]

Discussant

Belmar, Carolina (Depto. Antropología, Universidad de Chile)

[74]

Plants and Steppe Hunter-Gatherers in Central Patagonia: A Case Study from the Aisén Region (45°S, Chile)

Researching plant use among hunter-gathering groups has made visible the use of a predictable and ubiquitous resource that are locally and seasonally available, and have multiple potential uses. Recent studies at the Baño Nuevo 1 site (Aisén, Chile) have revealed that, even though these groups based their diet on the consumption of terrestrial fauna, the archaeobotanical record has indicated the consumption of plant resources as a supplementary food. Residue studies show the use of stone tools in the recollection, processing, and use of plant resources. For this presentation we compare the archaeobotanical record (fruits and seeds and residues/microfossils in stone tools) of three steppe hunter-gatherer sites that contain a long occupational sequence: Baño Nuevo 1 (10.750–3.100 cal years BP), cueva La Vieja (12.000–130 cal year BP), in the Ñirehuao basin, and El Chueco 1 (11.500–180 cal years BP), in the Cisnes basin. We can now evaluate, in a large spatial and temporal scale, the appropriation, processing and use of plants among steppe hunter-gatherers, considering the multiple potential uses that these resource have within these societies. FONDECYT PROJECT 11180388.

Belmar, Carolina [61] see Reyes, Omar

Belmar, Carolina [177] see San Román, Manuel

Beltrán, Boris [138] see Hurst, Heather

Bement, Leland (Oklahoma Archeological Survey, OU), Joshua Davis (OU) and Kristy Primeau (University of Albany)

[25]

Defining a Prehistoric Hunting Soundscape Using Archaeoacoustic Techniques, Black Mesa, Oklahoma, USA

Game calls applied to animal hunting often mimic the calls and sounds made by the intended prey. Other calls produce sounds that

draw on the intrinsic curiosity of the hunted animal. In this paper we investigate the use of rock gongs (cupule stones) to create a tone to attract artiodactyls within an acoustic gathering area associated with a prehistoric hunting complex consisting of hunting blinds and drive lanes. Research goals include defining the range within which a tone can be heard across a given landscape by the intended prey, and layering that soundscape over the distribution of mapped hunting features possibly used to hunt pronghorn antelope in the Black Mesa region, Oklahoma panhandle. Ethnographic analogy for the use of rock gongs to attract prey, along with attribution of cupule stone shrines to hunting activities strengthen the interpretation of this research.

Bement, Leland (Oklahoma Archeological Survey, OU)

[68]

Discussant

Benavente Escóbar, Carlos [197] see Combey, Andy

Bendtsen, Aká [50] see Turley, Cameron

Benedetti, Michael [36] see Ellis, Grace

Benedict, Laura and Virginia Lucas (University of Nevada, Las Vegas)

[76]

Dinner in the Desert: A Faunal Exploitation Investigation at California Wash, a Preliminary Analysis

The subsistence practices of people utilizing the California Wash in southern Nevada, northeast of Las Vegas, are not yet well understood. Analysis of the faunal material collected during excavations at two rockshelter sites located in the Dry Lake Range within the California Wash enhances our understanding of the subsistence practices of the people who used the area. This poster presents an updated analysis of those faunal materials collected at rockshelters 26CK1112 and 26CK1113 along with an associated roasting pit. Radiocarbon dates suggest occupations during the Late Archaic and Pueblo I periods. Early analysis indicates a dietary dependence on reptiles such as desert tortoise (*Gopherus agassizii*) and chuckwalla (*Sauromalus ater*). A reliance on reptiles in this area contrasts sharply with the dependence on artiodactyls such as bighorn sheep (*Ovis canadensis*) and mule deer (*Odocoileus hemionus*) that were utilized by surrounding communities.

Benfer, Bob (University of Missouri-Columbia)

[194]

Early and Middle Archaic Fishing Villages on the West Coast of America

The small Early Archaic coastal site of Quipa was followed by the larger Middle Archaic villages of Paloma in the same Chilca Valley of Peru. Studies of plants, animals, and human remains contribute to our understanding of these and other sites discussed in this symposium. These data will provide comparisons for a discussion of the origin of dense populations, including changes in climate, diet, health, subsistence activities, settlement patterns, and cosmology in early fishing villages.

Benítez de Lugo, Luis [35] see Priola, Victoria

Benjamin, Jeff (Columbia University)

[266]

In Praise of the Listening Act

If we accept Tim Hodkinson's definition of music as "sound that listens to itself" (2010), we are invited to privilege receptivity rather than projection as music's fundamental quality. It seems that listening has become the unmarked sign, the forgotten partner of speech and sound, and it is toward the reemergence of the ear within discourse that archaeoacoustics has so much to offer all academic disciplines. As an extension of Pierre Schaefer's formulation of musique concrète, I have suggested that the proper object of archaeoacoustics is not the forms and structures that produce and sustain sound and music, but rather the sounds themselves, conceived as sonic artifacts, or sonifacts. In recent years, sound artist and teacher Michael Asbill at the State University of New York in New Paltz has invited his sound-art students to enter post-industrial mining landscapes to reanimate sounds of the past as musical and archaeological form; in short, to make sonifacts. In listening to these sonifacts we are, quite literally, "hearing the past." Through the work of Asbill and his students, I would like to offer some thoughts on music and sound as archaeological form that is sculpted by the act of listening.

Benjamin, Jonathan [18] see Hale, Nathan

Benjamin, Jonathan [238] see McCarthy, John

Benjamin, Jonathan [252] see Woo, Katherine

Bennett, Ryan

[205]

The Patterns of the Drums: An Evaluation of Variation in Heger Type I Drum Motifs during the Period of the Dong Son Culture

One of the larger debates in studies of Bronze Age Vietnam is the symbolic meaning of Dong Son drums. However, in the academic

haste to find this overarching meaning there are several questions that have been left unanswered regarding iconographic variation. In this paper, it is my goal to address the iconographic variability of these drums and explore the roles of cultural influences and time on this variability. To conduct this research I shall be using materiality. This research uses a sample of 111 drums from locations across Vietnam to explore the variations in dimensions, motifs, locations, and age. In addition to the archaeological evidence, I explore the histories of cultural groups associated with these drums and their neighbors.

Benney Basque, Yvonne and Heather Rockwell (Wyoming State Historic Preservation Office)

[190]

Once a SCRAPer, Always a SCRAPer: Public Outreach and the Extraordinary Success of the New Hampshire State Conservation and Rescue Archaeology Program

The New Hampshire State Conservation and Rescue Archaeology Program (SCRAP) has inspired novice and professional, young and old, casual and focused scholars, to study the research, methods, and ethics of archaeological practice since 1984. The program has had tremendous success with many of its participants moving on to professional and scholarly roles throughout North America and, indeed, the world. This paper explores the foundations of the SCRAP and its later administration by former State Archaeologist Dr. Dick Boisvert. Specifically, the paper will explore the program public outreach successes, illustrated through the author's own examples.

Benson, Wyatt [148] see Patton, Natalie

Bentley, Heath (CPS Energy) and James Garber (Texas State University)

[239]

Material Presence of the British West Indian Regiments on St. George's Caye, Belize.

Once a colonial British frontier settlement, St. George's Caye was occupied by settlers and an enslaved population who experienced continuous population and economic growth punctuated by events of Spanish aggression and forced removal prior to the establishment of a formal British Colony. Following the Battle of St. George's Caye in 1798, soldiers of the British West Indian Regiments were stationed on the small island into the middle nineteenth century. Their presence across the Caye, documented in historical record is further demonstrated by deposits containing uniform buttons, metal firearm components, gun flints, lead shot and a shako plate, among others. The highest density of artifacts on the island has been found within its historic cemetery. Ongoing research on the artifacts mentioned above and an abundance of materials related to food and drink, recreation and other activities further orient the assemblage into association with these soldiers and sheds light onto the use of cemetery space during this period of occupation.

Bentley, Nicholas (Texas A&M University)

[8]

Storms, Sands, and Sinks: Hurricane Deposits in an Inundated Archaeological Site in Northwest Florida

How people respond to natural disasters is an ongoing theme in anthropological research. However, little research has been conducted focusing on how past peoples in North America responded to these natural disasters. One of the most common natural disasters thought to have impacted prehistoric societies, particularly in the Southeast of North America, are tropical cyclones. To understand how tropical cyclones impacted people in the past, we must first be able to see evidence of tropical cyclone activity in the archaeological record. The Page-Ladson archaeological site (8JE591) in Northwest Florida is located within a submerged sinkhole which has acted as a sediment trap, continuously preserving sediments since at least 17,000 cal BP. The youngest stratigraphic unit at Page-Ladson is a Holocene aged peat deposit with thin sand lenses throughout. This poster presents research which analyzes these sand deposits through radiocarbon dating, grain size analyses, and stable isotope analysis of the $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ isotopes to determine if these sediments were deposited through tropical cyclone activity. This paleotempestological study serves as much needed groundwork to help improve our understanding of how prehistoric societies were impacted by natural disasters, and how they may have adapted to these extreme weather events.

Benzonelli, Agnese [42] see Martín-Torres, Marcos

Beramendi-Orosco, Laura (Instituto de Geología, UNAM), Ana Soler-Arechalde (Instituto de Geofísica, UNAM), Galia González-Hernández (Instituto de Geofísica, UNAM) and Linda Manzanilla (Instituto de Investigaciones Antropológicas, UNAM)

[10]

A High-Resolution Chronology for the Palatial Complex of Xalla Combining a Bayesian Radiocarbon Model with Archaeomagnetic Ages

A high-resolution chronology for the palatial complex of Xalla, excavated by L. R. Manzanilla from 2000–2019, was constructed combining archaeomagnetic dates, a Bayesian radiocarbon model, and detailed information about sample type and archaeological context. The Bayesian model was calibrated using the Oxcal 4.3 program (Bronk Ramsey 2009) with the IntCal13 calibration curve (Reimer et al. 2013), includes 42 radiocarbon ages grouped in 6 phases. The first group includes samples from the roofs of large precincts with ages earlier than expected for Classic Teotihuacan period, suggesting a problem of inbuilt age (McFadgen 1982). The 11 archaeomagnetic ages were classified in unburned samples, related to the time of manufacture, and burned samples, related to fires either by rituals or during the Big Fire associated to the abandonment of the site. The calibrated ages have more precise intervals, allowing to distinguish different phases. By contrasting these with the archaeomagnetic ages, it was possible to identify the different construction phases and to confirm that big beams had inbuilt ages raging between 50 and 250 years. It is concluded that

by combining these two dating methods and understanding the moment that each sample type is dating, it is possible to obtain solid and precise chronologies.

Beramendi-Orosco, Laura [10] see Soler-Arechalde, Ana

Berger, Uri (Israel Antiquities Authority) and Gonen Sharon (Tel Hai College)

[60]

Dolmen Rock Art in the Levant

Thousands of dolmens are scattered throughout the southern Levant in Lebanon, Syria, Israel, and Jordan. These megalithic burials, dated to the early stages of the Bronze Age, are an understudied and little understood phenomenon of Levantine Archaeology. Unlike in Europe and other parts of the world, rock art has rarely been reported from Levantine dolmens, despite more than 150 years of research and hundreds of excavated dolmens of the thousands of megalithic structures recorded. A fortunate discovery, in 2012, of engraved features on the ceiling of the central burial chamber of a giant dolmen in the Shamir dolmen field has changed current knowledge. The dolmen, a multi-chamber megalith constructed using over 400 tons of huge basalt slabs and rocks, is evidence of existence of a hierarchical society during the Levantine Intermediate Bronze Age "Dark Ages." Since this finding, additional rock art has been discovered, including a panel of horned animals in a dolmen in the Meshushim field. Here, we will present the latest discoveries of Dolmen rock art in the Levant in the context of their significance to the broader phenomenon of the mysterious megalithic burials of the region.

Bergh, Sue [258] see Edelstein, Beth

Bergin, Sean (School of Human Evolution and Social Change, ASU) and Michael Barton (School of Human Evolution and Social Change, ASU)

[226]

Teaching Human Impacts on the Environment Using an Archaeological Perspective

As quintessential niche constructors, humans modify their surroundings in both intentional and accidental ways. The cumulative impacts of these socio-ecological interactions, with both positive and deleterious effects, has so transformed the Earth that scholars have labeled the most recent millennia of the human past the Anthropocene. Archaeologists are uniquely positioned to integrate paleoecological data with our knowledge of our cultural and historical past for the purpose of explaining long-term human environmental interactions. In this paper we describe a course we teach that is designed to examine the long history of human environmental interaction through case studies from recent archaeological literature and assignments that promote critical thinking. By focusing on instructive cases studies from the past we are able to provide an overview of past societies while detailing the evidence and reasoning archaeologists use to interpret past human and environmental interactions. Assignments are designed to teach students conceptual models used to understand human decisions and demonstrate the ways in which the choices of individuals have cumulative effects. Learning the dynamic and lengthy history of impacts people have had on their environment can enable students to form a better calculus to confront today's environmental issues and create a sustainable future.

Bergin, Sean [77] see Snitker, Grant

Bergman, Stephanie [9] see Steffen, Anastasia

Bergmann, Christine (University of South Florida)

[203]

Exploring the Environmental Context of Early Settlement in the Chincha Valley, Peru

The Chincha Valley, located 200 km south of Lima, is one of the largest valleys on the south coast of Peru. Paracas, believed to be the oldest complex society on the southern coast of Peru, occupied the Chincha Valley during the Early Horizon Period (900–200 BCE). Although Paracas is well represented in the archaeological record, relatively little is known about the populations that settled in the region, as well as the environment in which they lived, prior to Paracas. Recent excavations at Pozuelo, the earliest known site in the Chincha Valley, suggest the region was inhabited prior to Paracas occupation. Additionally, pollen and phytolith analyses performed on soil from Pozuelo indicate the environmental context during initial settlement of the region was vastly different from what is seen today. Radiocarbon dating and elemental analysis on soil excavated from Pozuelo are performed to tests the hypotheses that inhabitants prior to the Early Horizon Period had the ability to occupy the region in the absence of irrigation agriculture as well as use landscape modification strategies to permit the cultivation of agricultural resources.

[203]

Chair

Berikashvili, David (International Archaeological Center of the University of Georgia)

[192]

Cultural Transitions through the Centuries in the South Caucasus (New Archaeological Data from Samshvilde)

Samshvilde in the South Caucasus (Southern Georgia), is a complex and multi-period archaeological site. The historical city occupies an impregnable location on a basalt cape flanked by the deep gorges. This distinctive landscape, combined with environmental conditions and abundant natural resources, have attracted humans for millennia. Samshvilde and its surroundings have been inhabited since the Neolithic era, but the urban complex dates mainly to the medieval period, under Armenian and then Georgian control, when it became the region main fortress and political center. Recent archaeological and bio-archaeological

studies of the site revealed the oldest stratigraphic contexts, which are represented by Neolithic and Bronze period contexts. The stone and bone industry of Samshvilde, characteristic for the Caucasian Neolithic gives a new understanding for transitional period from hunter-gatherers to early agricultures. Also, the discovery of the Late-Bronze cemetery in Samshvilde is an important phenomena for understanding the cultural processes at the end of II millennia. Future expansion of the project, priorities, as well as the methods of conservation will be presented. The results of the studies of medieval Samshvilde, located at the Armenian-Georgian border will be also presented.

Berkebile, Jean [255] see Forste, Kathleen

Berkebile, Jean [235] see Turner, Michelle

Berman, Mary Jane (Miami University) and Ivan Wehner (Miami University)

[252]

Theorizing Lucayan Ceramics: Perspectives from the Central Bahamas

Palmetto ware is the ubiquitous locally made pottery associated with the Lucayans, the indigenous inhabitants of the Bahama archipelago. The earliest published descriptions of Palmetto ware regard it as largely uniform, possessing little variability. Typically, ceramics were lumped into a few categories (plain ware, basketry-impressed ware, sherds with incision or punctuation). At the time that these ceramic descriptions were published, there were no radiocarbon dates for the sites from which they originated. Once sites started to be dated chronometrically, however, it was found that this pottery came from Late Lucayan period assemblages. Older occupations, which we attribute to the Early Lucayan period, had not yet been recognized. Over the past two decades, Early Lucayan period sites from islands in the central and northern Bahamas have been excavated and their ceramic assemblages have been studied. Differences in several ceramic attributes between the two periods are observed. The intra- and inter-island similarities observed for each period suggest clearly defined constellations of practice. We examine the technological, morphological, and stylistic differences in assemblages from both periods and address performance characteristics, modification of culinary practices, and changes in gender task and time allocations to explain the observed temporal variability.

Berman, Mary Jane [59] see Beamer, Dawn

Berna, Francesco [263] see Kulick, Rachel

Bernard, Henri (Universidad Veracruzana) and Sara Ladrón de Guevara (Universidad Veracruzana)

[191]

Stone Figurines of the Middle Formative in Mesoamerica

The first reported green stone figurines from controlled excavations in Mesoamerica occur in Middle Formative (900–400 BC) contexts. Among the best known are those from Offering 4 at La Venta. Mid-twentieth-century excavations at La Venta, conducted by Mathew Stirling, Philip Drucker, and Robert Heizer also produced the largest number of in situ figurines found. Few other examples have been found outside this site, in places like Arroyo Pesquero or Cerro de las Mesas. This presentation will address the range of objects reported with archaeological contexts, to observe the temporality, region where they appear and with their associated elements. A stylistic analysis on figurine will be presented and compare with the definition based on the observations made by various authors to see if all the objects can be included in the same style. In addition, we will distinguish similarities and differences in their final deposition, to observe possible relationships with documented Mesoamerican rituals for other regions and temporalities.

Bernardini, Wesley [98] see Solometo, Julie

Berner, Jack (University of California, Los Angeles) and R. J. Sinensky (University of California, Los Angeles)

[148]

Reconstructing Household Architecture in the Petrified Forest Region of Northern Arizona, AD 200–600

The Petrified Forest region of Northern Arizona hosted a dense concentration of mobile farmers during the Early Brown Ware Horizon (AD 200–550). During this interval, large habitation sites with upwards of 20 pit structures were frequently located in prominent places on the landscape, such as tall isolated mesas. One such site, Flattop, was excavated by Fred Wendorf in 1949, and was recently the subject of low-impact test excavations conducted by UCLA. To better visualize how Flattop might have appeared while occupied and following abandonment, this poster offers geospatial reconstructions of different types of structures at Flattop using two-dimensional and 3D maps at multiple scales. These include a site-wide map displaying structure orientation and layout, 3D maps of individual structures, and a profile visualization of two structure's botanical assemblages. Wendorf's 1953 report and recent excavations suggest architectural variability among structures within Flattop, notably: small, circular, slab-lined structures and pit structures with extended slab-lined entries. To better visualize distinctive assemblages in burned and unburned structures, reconstructions incorporate botanical data from recent analysis of flotation samples from two pithouses.

Bernstetter, Jessica (University of Missouri), Kate Trusler (University of Missouri) and Wayne Lorenz (Wright Paleohydrological Institute)

[159]

Space and Visual Display in the House of Efebo: A Case Study for Water as Wealth in Roman Pompeii

The introduction of the Aqua Augusta, also called the Serino Aqueduct, greatly changed how Pompeii and other towns in the Bay of Naples managed water. Before the aqueduct, water was accessed using wells or rainwater stored in cisterns. The arrival of the

Aqua Augusta in the first century CE supplied Pompeii with vast quantities of water which fed public fountains, public baths, and private homes. While public fountains provided people with drinking water, wealthier homes could install lead piping and pay for private access to the aqueduct water. Using the House of Efebo as a case study, this paper explores how high-status households used water and space to visually display their wealth with a variety of elaborate water features such as fountains, pools, impluvia, and even private baths. During the 2018 and 2019 field seasons, the Pompeii Sanitation and Water Project surveyed the House of Efebo, among others, to record and measure water features and metal detect for buried lead piping. This paper discusses the survey results and illustrates how the House of Efebo used space and elaborate water features to display wealth and status, and how those features influenced the function of household spaces.

Bernstetter, Jessica [159] see Trusler, Kate

Berquist, Stephen (University of Toronto)

[106]

Tecapa: Monumental Evidence of Sociopolitical Transformation on the North Coast of Peru, 800–1000 CE

Tecapa, located along the southern desert margin of the Jequetepeque Valley, is one of only a small number of monumental sites to have been both constructed and abandoned within the "Transitional Period" (800–1000 CE) of the north coast. As such it provides a critical window into sociopolitical developments in the Jequetepeque and larger Andean region during the Middle Horizon. Erected alongside the Late Moche (600–800 CE) Huaca Colorada, the builders of Tecapa eschewed traditional Moche aesthetics and iconography. Material culture and architecture are heavily influenced by contemporary assemblages from the Cajamarca highlands. While similar sites on the coast have been construed as intrusive highland "colonies", evidence at Tecapa points toward a different interpretation: local coastal communities actively collaborating in the construction of Tecapa and participating in the ceremonial activities hosted by it. Yet the most striking aspects of Tecapa are its architecture and spatial organization. Configured in orthogonal patio groups arrayed around a massive plaza, Tecapa must clearly be put into conversation with the Wari phenomenon. However, the utter absence of any other "Wari" features as well as the strong indications of continuity with local practices past and future necessitate reassessing the genealogy of this spatial configuration.

Berry, Miranda [37] see Nash, Brendan

Berry, Nora (Texas State University), Christina Conlee (Texas State University) and Deborah Spivak (Washington University, St. Louis)

[243]

A Ceramic Analysis of the Middle Horizon site of Huaca del Loro

Since being labeled the type-site for the Loro ceramic style, Huaca del Loro has been thought to play a central role in cross-cultural relationships of Middle Horizon south coastal Peru. As a local Middle Horizon style, Loro ceramics sit between the Nasca and Wari styles. This begs the question about the resounding connection that Huaca del Loro had with the Wari state. The authors analyzed ceramics from the 2019 field season at Huaca del Loro to understand how their contexts related to their overall styles and forms. Of the five sectors at the site, three were excavated and investigated this season including areas with Wari imperial architecture, a cemetery, and an area of local-style architecture. The form, function, and style of ceramics were recorded from each of the sectors in order to understand the groups that lived there and how they may have interacted. The assemblage consisted of Loro, Wari, and Late Nasca styles. The percentages, placements, and distributions of different ceramic styles throughout the site suggest a different type of relationship between the Wari and the Las Trancas Valley than previously thought.

Berryman, Judy [122] see Walker, William

Berryman, Stanley (New Mexico State University)

[269]

Return to Santee Greens: How the Ethnohistoric Village of Micheagua (SDI-5669) Continues to Inform about the Late Holocene in Southern California

The Santee Greens village site, CA-SDI-5669 (Micheagua) was first recorded in 1977 as a large Late Holocene habitation area along the San Diego River in Santee, California. (S. Berryman, 1977 and J. Berryman 1981). A new look at this site is currently underway using the extensive database recovered by the 1970's excavation which included excavation of controlled trenching, auger units, and standard units resulting in 480.49 m³ screened and analyzed. The excavated village area covered 29,074 m² with two occupation periods, AD 760–1030 and AD 1735–1890. This is the story of the excavation 223,236 artifacts, including 46,753 ceramic sherds, 718 projectile points, 83,000 stone flakes, tools, beads, ritual items, and special studies. This new look involves using the existing data, additional C14 dates, obsidian and chert sourcing, and data from a recent excavation within SDI-5669 but outside the boundaries of the original excavation. Santee Greens shows what was old can be used to develop new ways of looking at the past.

Berube, Eloi [211] see Johnson, Lisa

Berumen, Sara, Meredith Chesson (University of Notre Dame) and Susan Sheridan (University of Notre Dame)

[35]

Uncharted Territory in Emerging Urbanism: Gender, Life Course, and Lived Experience of Urbanizing People Buried in Charnel House A56, Bab adh-Dhra', Jordan

Charnel house A56 at Bab adh-Dhra', Jordan offers a fascinating case study to explore the nature of change and continuity when community members transformed their unwallled village into a fortified town site during the transition from Early Bronze Age (EB) IB to early EB II (ca. 3050–2950 BCE). Throughout the southern Levant, EBA people decide to enclose their communities with large fortification systems, spurring the development of small-scale urbanism. While many economic practices in these agro-pastoral communities may have been similar, the way they organized their daily lives throughout their life course may or may not have changed in these new urbanizing communities. This poster presents the analysis of skeletal remains and material culture from charnel house A56, located in one of the region's few large, well excavated cemeteries. Excavated in 1979, the human remains and accompanying material culture have not been analyzed until now. Traditional bioarchaeological and archaeological methods will be combined with feminist approaches to the life course in order to explore the lives of these individuals. This analysis provides greater understanding into the ways that urbanizing cultural forces transformed, or left unchanged, the lives of Bab adh-Dhra's inhabitants.

Betancur, Sebastián [246] see Weber, Marion

Bethard, Jonathan [169] see Bews, Elizabeth

Bethke, Brandi (University of Oklahoma), Emily Lena Jones (University of New Mexico), Gregory Hodgins (University of Arizona) and William Taylor (University of Colorado Museum of Natural History)
[119]

Archaeofaunal and Biomolecular Evidence for Early Adoption and Use of Domestic Horses in the American West

Although horses are linked with drastic social and economic transformations to Indigenous societies in the Americas following their introduction, the early adoption of horses by Native peoples is poorly chronicled in the archaeological or historic records. In tandem with historic and ethnohistoric accounts, the multimethodological study of archaeological horse remains from museum collections using both osteological and biomolecular techniques (radiocarbon dating, ancient DNA, stable isotopes, and ZooMS) provides a powerful framework for understanding the spread of horses and their impact. Contrary to some historical models, our analysis of archaeological horse remains from museum collections across the American West suggests a rapid and widespread incorporation of domestic horses into some Indigenous lifeways and cultures by the mid-seventeenth century—along with insights into the management techniques, equipment, movements, and feeding practices used by early horse cultures.

Bettencourt, Luis (University of Chicago, Mansueto Institute for Urban Innovation)
[26]

Discussant

Bettencourt, Luis [26] see Smith, Michael

Betti, Lia [159] see Briggs, Emily

Bettinger, Robert (University of California, Davis)
[253]

Two Only Slightly More Complicated Models of Technological Investment

Expanding upon an earlier paper by Ugan, Bright, and Rogers (2003), in 2006 Bettinger, Winterhalder, and McElreath (2006) presented a simple model to formalize rational investment of time in tool making: how to make the best performing tool possible in the least amount of time, where tool performance is measured by the rate at which resources are procured or processed when using it. The resulting model was correct in structure but not in the definition of variables or the conclusion that it implied that more costly and less cost effective, but better performing, tools are a response to increasing volume of handling, which is true but not implied by the model. I correct the definition of variables in the original model, draw different implications from it, and present two equally simple but differently structured models that maximize returns, rather than return rates, per unit of time.

Betts, Colin (Luther College)
[63]

Multi-Instrument Geophysical Survey of an Effigy Mound Site in Allamakee County, Iowa

This poster presents the results of a multi-instrument geophysical survey of two Keyes phase (AD 700–1000) bird effigy mounds from the Capoli Bluff site (13AM204) in northeastern Iowa. Three remote sensing techniques—magnetic gradiometry, soil resistivity, and ground penetrating radar—were used to investigate the subsurface characteristics of the Capoli site effigy mounds. The purpose of this research was to document the geophysical signatures of mound construction. As the material vestiges of the ritual practices involved in mound ceremonialism these data are essential for gaining a fuller understanding of the effigy mound phenomenon. The surveys yielded complementary insights into the methods of mound construction, internal structure, historic disturbances, and documented significant differences between the two mounds. This research provides important clues to the nature of Capoli site mound ceremonialism and more broadly establishes a reference point for guiding and interpreting future geophysical surveys of effigy mounds.

Bevan, Andrew

[42]

Discussant

[42]

Chair

Bevan, Andrew

[48]

Computational Models of Human Settlement Behavior: An Overview of Current Methods and Motivations

Computational models of human settlement have been noticeable features of intra- and interdisciplinary research for several decades, whether such models focus on the present day, on the historically documented near-present or on deeper archaeological time-scales. Now is a useful moment to revisit the pedigree of these different strands of research, as well as what problems and potential they hold today and what problems they seek to address in future. This paper leaves to one side those models primarily concerned with the 'pure prediction' of past settlement intensity (e.g., those intended to predict and protect dwindling heritage resources: a very important but different objective), and instead will take stock of where we are in terms of developing computational models that help us understand issues such as changing locational priorities in the past, the emergence or disintegration of settlement sizes and hierarchy, altered subsistence or territorial strategies, or indeed patterns of short or long distance cultural and economic interaction. Emerging from an exciting and diverse range of settlement modeling applications today are also several persistent challenges in urgent need of wider debate.

Bevan, Andrew [42] see Li, Xiuzhen

Bews, Elizabeth, Zsolt Nyaradi (Haáz Rezső Múzeum), Jonathan Bethard (University of South Florida), Katie Zejdlik (Western Carolina University) and Andre Gonciar (ArchaeoTek-Canada)

[169]

An Osteobiography of a Juvenile Individual from Papdomb, Transylvania

Frank Saul introduced the term osteobiography in 1972, which he described as a way to discern specific life patterns from individual remains. Recently, archaeologists have expanded upon Saul's ideas by combining osteological analyses, archaeological evidence, and historical documentation to construct life portraits of individuals, and the societies in which they lived. Using an osteobiographical approach, this paper examines a juvenile individual from a medieval mortuary context in the Hungarian region of Transylvania. This individual displayed bilateral clavicular rhomboid fossae and was buried with a headdress. The presence of a rhomboid fossa on the left clavicle indicates with 92.2% probability that the individual is male; however, few studies have explored this osteological indicator in non-adult individuals. This is notable because a small number of juveniles at the site were buried with headpieces, while the vast majority were not. Given the presence of rhomboid fossae in this individual and its reliability for sex estimation in adults, this individual's headdress could shed light on sex-specific mortuary treatment at Papdomb. This case study therefore presents a framework for identifying divergent mortuary practices based on sex, specifically the use of headdresses as cultural symbolism amongst the medieval population at Papdomb.

Bey, Bridget (Washington University, St. Louis) and Jane Buikstra (Arizona State University)

[169]

Puberty in Prehistory: Pubertal Timing in the Late Woodlands

The major physiological changes of puberty parallel different phases of the pubertal growth spurt, and therefore the phases of puberty, are identifiable at sites of skeletal development. Shapland and Lewis (2014, 2013) developed a composite method of pubertal phase assessment based on evaluation of six skeletal sites using Medieval English adolescents (tenth–seventeenth centuries). The current paper assesses the applicability of Shapland and Lewis' method with Middle and Late Woodland (100 BC–1000 AD) Native American remains from the lower Illinois River Valley. This study of Late Woodland adolescents is the first assessment of pubertal development in Prehistoric Native Americans and demonstrates that Shapland and Lewis' method can be applied to prehistoric remains. As predicted, the Woodland adolescents experienced late pubertal stunting similar to what Shapland and Lewis (2016) observed in their English sample, which suggests that pubertal timing in Medieval England and Prehistoric America differed from pre-industrial societies. This data may also support Shapland and Lewis' theory that malnutrition and disease strongly affected puberty, but further analysis is required. Verification of the Shapland and Lewis' method is important for bioarchaeology since the estimation of pubertal phase improves understanding of underlying health patterns related to the social change from child to adult.

Bey, George (Millsaps College)

[158]

Discussant

Beyin, Amanuel [36] see Durham, Jordan

Bianchi, Pablo (ANPCyT - IMHICIHU)

[233]

About Clay and Food: Assessing Local Manufacture and Use of Pottery during the Late Holocene in the Middle Chico River Basin (Patagonia, Argentina)

The presence of pottery in Central-South Argentinian Patagonia has been accounted by several authors over the years. It has been

proposed that pottery was a late development by hunter gatherer groups with high mobility ranges. The scarcity and heterogeneous distribution of this technology over the whole region bring serious difficulties for the assessment of its origins, production locations and uses. Some authors (Gofi 2010; Cassiodoro 2011) proposed that the production of pottery to the West was related to a reduction in group mobility. However, the case is not so clear to the East. A general characterization of an assemblage of potsherds recovered in an intermediate space between the coast and the forest (Estancia 17 de Marzo) is presented. The goal is to discuss the origin of the clay used for the manufacture of the vessels, as well as their utilization for resource processing activities. In order to achieve our objective we conducted petrographic, stable isotope and FT-IR microscopic analysis. The results obtained enabled us to explore the technological strategies developed by highly mobile societies during the Late Holocene.

Bibby, David (Regierungspräsidium Stuttgart)

[24]

Stratigraphy and the Harris Matrix in the German-Speaking Area 1986–2019

Stratigraphic discussion is present in all the German-speaking countries of Europe, though it sometimes takes surprising turns for the uninitiated. Maybe this is because in the German-speaking area of Europe archaeology is for the most part not studied as such, but, for example, as subjects such as "Prehistory," "Past and Early History," "Provincial Roman Archaeology," or "Medieval Archaeology." And it seems as if stratigraphic awareness very much depends on the "type" of archaeology learned and practiced. It could be postulated: "the later the epoch, the higher the stratigraphic awareness," and there is a higher likelihood that a Harris Matrix might appear in a report of a medieval excavation than of a loamy wide-area prehistoric excavation, where the question as to whether a posthole with fill should receive one number or two might still get asked and discussed, often quite dogmatically. On the other hand, some of the best stratigraphic thinkers are from German-speaking countries and a number of internationally recognised digital Harris Matrix tools have their origins there too. This contribution attempts to analyse how these contradictions fit together, on the basis of the contributors almost four decades in Germany as excavator, stratigrapher, and computer archaeologist.

Bicho, Nuno (Universidade do Algarve), Jonathan Haws (University of Louisville), João Cascalheira (ICArEHB - Universidade do Algarve), Célia Gonçalves (ICArEHB - Universidade do Algarve) and Mussa Raja (ICArEHB - Universidade do Algarve)

[250]

Stone Age Archaeology in the Elephant River Valley, SW Mozambique

Located between modern-day South Africa and Tanzania, both of which with well-known and extensive Stone Age records, Mozambique and its Stone Age sequence remain largely unknown in the broader context of African Pleistocene prehistory. This is despite the country's critical position linking southern and eastern Africa, and of its clear potential to inform various models about recent human evolution. Here, we present the results of field survey, testing and archaeological excavation in the Elephant river valley, in the Massingir region of SW Mozambique. The Stone Age research took place between 2015 and 2019 and dozens of surface sites were found with ESA, MSA and LSA assemblages. Three sites were excavated, providing important lithic and organic collections as well as absolute dates: Mapa, Txina-Txina, and Machampane 1.

Bicho, Nuno [34] see Gonçalves, Célia

Bicho, Nuno [11] see Haws, Jonathan

Bielenberg, Aliosha (Brown University), Charles Steinman (Brown University), Soumen Mallick (Brown University) and Michele Hayeur Smith (Brown University)

[50]

The North Atlantic Wool Trade, ca. 1000–1400: A Strontium Isotope Approach

North Atlantic islands were colonized by settlers from Norway and the British Isles in the ninth century, bringing agricultural practices from Northern Europe. Wool and fish dominated exports from Iceland from the Viking Age, though the impact of the wool trade remains understudied. We examine textile collections from museums to explore the intensity and extent of this trade by strontium isotope analysis. The data we find provide us with information about how wool moved across the North Atlantic during this period. In turn, this helps us understand when and how wool began to connect very distant communities. We draw on our specific case study to offer suggestions on how to better use strontium isotope data for archaeological purposes and how to improve our methods of data collection and analysis. Our paper focuses especially on the challenges of reconciling archaeological and geochemical methods, approaches, and data.

Biggie, Michael [178] see Ellis, Olivia

Biggs, Jack (Michigan State University), Amy Michael (University of New Hampshire) and Gabriel Wrobel (Michigan State University)

[240]

Buried in the Maw of Xibalba: The Bioarchaeology of the Sac Uitzil Ba Maya Rockshelter in Central Belize

Previous research on Maya rockshelter use in central Belize has shown that most mortuary rituals occurred during the Late Preclassic and Protoclassic periods by local rural village communities. Recent excavations at Sac Uitzil Ba (SUB), a small rockshelter mortuary site, adds to this emerging picture of the ritual landscape of the Caves Branch River Valley. In 2017, work carried out by the Central Belize Archaeological Survey (CBAS) exposed 5 in situ primary burials, at least 4 more individuals from looted contexts, and an array of burial goods. Similar mortuary behavior patterns were noted at the proximal Caves Branch (CBR) and Sapodilla (SDR) rockshelter sites also excavated by CBAS. Indeed, the findings from SUB underscore the need for further research into the funerary treatment of agrarian villagers in the Late Preclassic to Protoclassic periods. Discoveries such as a

metate (SUB), jadeite beads (SUB), special use areas with ceramic sherd offerings (SUB, SDR), intact grave vessels with primary burials (SUB, CBR), polychrome vessels (SUB), and varying interment patterns indicate that rockshelters, a largely understudied space, are complex and rich sources of data regarding early Maya rural life.

Billadello, Janine (The Graduate Center, CUNY)

[233]

Lipids Analysis on Precolumbian Ceramics from the Copan Valley, Honduras

Excavations in the Copan Valley, Honduras have recovered volumes of ceramic material over the years. While much effort has been devoted to the study of these collections, data directly concerning what was cooked or otherwise processed in particular vessel types remains scarce. The ability to recover biochemical traces of plants and animals from the paste of unglazed ceramic vessels has enhanced archaeological interpretations of ancient pottery use in some regions, but such methods have not been widely utilized in Mesoamerica. This paper presents the preliminary results of one technique, lipid residue analysis, which was carried out on potsherds sampled from two socioeconomically distinct residential settlements dating to the Late to Terminal Classic period. Ceramic types from the royal-residential compound known as Group 10L-2 at Copan are compared to those from the site of Río Amarillo, a rural satellite community located east of Copan. The presentation will explore whether the data derived from lipids analysis of these potsherds can add to or refine our current understanding of the relative status of these sites, and their relationship throughout the period surrounding Copan's decline.

Billeck, William

[203]

pXRF Analysis of Opacifiers in White Glass Drawn Beads from Nineteenth-Century North American Plains Indian Village Sites and Trading Posts

Small white drawn glass beads are common in historical archaeological assemblages and have very limited stylistic chronological variation. A pXRF study of nineteenth-century Native American and trading post sites in the Plains demonstrates a pattern of change in opacifiers from antimony to lead-arsenic. The transition from antimony to lead-arsenic begins in the first quarter of the nineteenth century and by the mid-nineteenth century lead-arsenic dominates. Beads with lead-antimony as an opacifier also occur but only in the uncommon, larger drawn beads. pXRF is a nondestructive method that can help date glass bead assemblages by using one of the most commonly encountered glass bead varieties.

Billman, Brian (UNC & MOCHE, Inc) and Patrick Mullins (University of Pittsburgh)

[174]

From Temple to Town: A Social History of a Four-Valley Region on the North Coast of Peru between 1000 BC and AD 1

The period from BC 1000 to AD 1 was a time of significant regional sociopolitical change on the north coast of Peru. This period spanned the rise and fall of Chavin regional influence and the subsequent development of a mosaic of polities (senorios) across the north coast. We present a reconstruction of the social history of a four-valley region, consisting of the Chao, Viru, Moche, and the Chicama Valleys, during the last millennium BC based on our analysis and interpretation of regional settlement patterns ($n > 2,000$ sites) and changes in ceremonial, public, and defensive architecture. We found evidence of significant sociopolitical change in this region between BC 500–300, including abandonment of all Early Horizon ceremonial centers; aggregation of population into large settlements and settlement clusters; a sharp increase in the total area of habitation sites; redistribution of most regional population into defensible settings; and construction of the first defensive fortifications in these valleys. Similar patterns of change were found across the four-valley region. We propose that competition over irrigated coca fields in the chaupiyunga was the primary source of violent conflict in the four-valley region and adjacent valleys, beginning in the Salinar phase (circa BC 400–1 AD).

Billman, Brian [174] see Mullins, Patrick

Binetti, Katie [8] see Ferraro, Joseph

Bingham, Dayle [66] see Thompsett, Neil

Binning, Jeanne (California Department of Transportation)

[232]

Bipolar Reduction Revisited

Over the past 20 years, the recognition and implications of bipolar reduction debitage in the archaeological record have finally been accepted as an important consideration in lithic analysis. In some prehistoric contexts, it is critical that bipolar debitage be recognized to prevent a misinterpretation of aspects hunter and gatherer behaviors related to mobility, procurement, accessibility of tool stone, and the desire for raw materials with specific qualities. Critical factors to be considered are discussed and examples are presented.

Birch, Jennifer (University of Georgia), Megan Conger (University of Georgia), Sturt Manning (Cornell University) and Louis Lesage (Huron-Wendat Nation)

[12]

Reframing Timescales for Longhouse and Community: Radiocarbon Chronologies for Enhanced Ancestral Wendat Household and Community Histories

In this paper, we consider how high-precision chronologies informed by radiocarbon dating and Bayesian modeling are causing us to rethink local and regional histories of ancestral Wendat village life. Our research is concerned with developing enhanced chronological resolution for the period between AD 1450–1650 when the escalation of conflict, large-scale population movements, confederacy formation, and incipient European contact was reshaping the geopolitical environment in the northeast. Our approach goes beyond simply locating houses in time. We consider how the replotting of archaeological history in a refined, absolute timeframe permits a reexamination of the relations, dispositions, and motivations of Wendat household and community members. This interpretive context is then used to reframe archaeological evidence for variability in household design, use, and the practices and relationships household and community members engaged in at selected village sites. Particular emphasis is placed upon variability in the ways in which households became incorporated into existing communities at several different village sites. The resulting insights permit the writing of archaeological histories that position people, rather than generalized processes, at the forefront of our understandings of the archaeological record. Such reexamination of histories and context helps descendants to better understand the life and times of their ancestors.

Bird, Darcy (Washington State University), Kyle Bocinsky (Crow Canyon Archaeological Center) and Tim Kohler (Washington State University)

[229]

A Comparative Approach to Paleodemographic Proxies: A Case Study in the Southwest

Paleodemographic research is currently undergoing a fluorescence in different representative proxies, from increasing research on the effect of taphonomic bias on radiocarbon ages (Bluhm and Surovell 2018) to the addition of fecal stanol concentrations in lake sediment as a robust population proxy (White et al. 2019). We ask: how closely do independent population proxies correspond to each other and, presumably, population? We compare two population proxies: occupational histories modeled using surface finds employing ceramic typologies anchored via dendrochronology (Ortman et al. 2007), and smoothed curves provided by tree-ring dates treated by the protocols typically used for summed probability distributions of 14C dates. We use the Village Ecodynamics Project (VEP) database for VEP North (most of the central Mesa Verde region in southwestern Colorado) and VEP South (most of the northern Rio Grande region of New Mexico). We provide an analysis of the strengths and weaknesses of the two methods considering the archaeological and taphonomic issues in the respective areas.

Bird, Darcy [26] see Freeman, Jacob

Bird, Douglas (Penn State University)

[117]

Discussant

Bird, Douglas [15] see Coddling, Brian

Birge, Adam (University of Texas at San Antonio)

[200]

Movement, the Sacred, and Appropriations: Inka-Carangas Interactions in Sajama, Bolivia

When the Inka arrived in the Sajama region, they encountered the Carangas, a pastoralist group, living in pukaras along a corridor between the coast and the highlands. Based on limited ethnohistoric sources, the Carangas allied with the Inka against the neighboring Pacajes and, in exchange, allowed the Inka to pass through the region. This relationship was marked materially in the Sajama with Inka styled portable goods and limited Inka constructions. It is unclear how exactly the Carangas benefited from Inka imperialism, which is typically marked by reciprocity. This paper argues for the hegemonic control of the Sajama Carangas and the local appropriations of Inka imperialism into the sacred landscape and local political systems. By taking a collective action approach, I argue that the Carangas accepted Inka imperialism as it afforded them protection and allowed elites access to Inka-local goods. This exacerbated local power struggles resulting in increased factionalism that eroded capacity to organize collective action. Evidence of these interactions may be found in the selective consumption of Inka goods, use of Inka high-altitude sanctuaries, and the practice of ceques that continued into the historic period.

Birge, Adam (University of Texas at San Antonio)

[224]

Chair

Birkett, Courtney [9] see McDaid, Chris

Birkmann, Joseph [148] see Norris, Austin

Birtell, Tabitha and Emily Schach (Arizona State University)

[260]

Degenerative Joint Disease of the Spine at the Site of Yzacachi: Considering Labor Practices during the LIP and Late Horizon

Degenerative joint disease (DJD), sometimes referred to as osteoarthritis (OA), is not a single disease but can be recognized as a common reaction pattern of joint tissues to several types of injury. While several risk factors may lead to the development of DJD, certain occupational or mechanical stresses have been recognized as important causes of this pathological condition. Participation in various physical activities can place different types of physical stress on the skeletal system which manifest in different forms on

the surface of bone. The following research documents DJD of the spine in individuals from the Yaracachi site of Moquegua, Peru. Dating to the Late Intermediate (ca. AD 1000–1476) and Late Horizon (ca. AD 1476–1530) periods, this collection includes the remains of more than 1000 individuals which were unearthed during a 2010 rescue excavation. This study explores the possible relationship between degenerative joint disease (DJD) and corvée labor imposed by the Inka as the Moquegua region was integrated into the expanding Inka Empire.

Bischoff, Robert (Arizona State University)

[17]

Geometric Morphometric Analysis of Hohokam Projectile Points from the Tonto Basin

Projectile points are often used as material markers of identity; however, in the Southwest United States, they are often eclipsed by discussions of ceramics once these enter archaeological assemblages. This study is designed to investigate how identity and interaction can be studied using projectile point morphology in this region. Traditional analysis of projectile points often uses visual identification, the presence or absence of discrete characteristics, or linear measurements to classify the point as a distinct type. Geometric morphometrics provides better tools for analyzing, visualizing, and comparing 2D and 3D shapes. As a test of the effectiveness of various geometric morphometric methods, I analyzed projectile points from the Tonto Basin, collected during a series of major archaeology projects conducted in advance of the expansion of the Roosevelt Reservoir. I also include modern replications of projectile points and points located in other areas of the Southwest for comparison. Elliptical Fourier analysis and landmark-based analyses will be conducted with the intent to identify discrete clusters of similar projectile points and compare the effectiveness of each method.

[17]

Chair

Bishop, Anna

[130]

Internal Variations among the Elite Classic Maya at El Zotz

This paper discusses the internal structure of the elite Classic Maya at the site of El Zotz, in the Petén region of Guatemala. By examining the behavior of elites living in different parts of El Zotz at the end of the Late Classic, I will consider whether the aristocracy of the Pa'ka'n court acted as a cohesive unit with shared behaviors, or if they were segmented with significant variation in practices between groups. The extent to which nobility differed at the same site, and in what ways they differed, can shed light on the internal organization and relations of the Maya elite at a small royal center. This paper uses material evidence, with an emphasis on ceramics, to ask questions about a variety of behaviors, such as domestic, ritual, and external trade practices.

Bishop, Anna [206] see Garrison, Thomas

Bishop, Katelyn (University of California, Los Angeles)

[98]

Ritual Practice, Ceremonial Organization, and the Value and Use of Birds in Prehistoric Chaco Canyon, New Mexico

In the North American Southwest, the long-term centrality of birds to Pueblo ceremonial life has been demonstrated both ethnographically and archaeologically, where whole birds and their parts have been frequent participants in or components of ritual practice. Despite the wide acceptance that Chaco Canyon was a central location for ceremony and ritual in the northern Southwest during the Pueblo II period, few details of the nature of ritual practice have been reconstructed. This paper explores the use and significance of birds in Chaco in order to reconstruct details of ceremonial life during the canyon's major occupation (AD 850–1150). Seven museum collections were examined to produce a dataset that presents all avifaunal remains excavated over the last 130 years. Results not only shed light on the nature of Chacoan ritual, but also demonstrate the importance of (re)examining collections from historic excavations, and the value of using legacy and archival data to enhance provenience and contextual information. The focus of this research on uniting historically produced collections with archival documents and legacy data was inspired and made possible by the work of Stephen Plog and the mission of the Chaco Research Archive, which serves as an exemplary model for such work.

Bishop, Katelyn (University of California, Los Angeles)

[129]

Chair

Bishop, Ronald L. (Smithsonian Institution)

[168]

Discussant

Bishop, Ronald [237] see Robinson, Eugenia

Bishop, Ronald [128] see Zralka, Jaroslav

Bisulca, Christina (Detroit Institute of Arts), Marilen Pool (Arizona State Museum) and Nancy Odegaard (Arizona State Museum)

[258]

Plant Exudates of Arizona: Use, Materials Properties, and Testing

In the material culture of the American Southwest, several plant and insect exudates were utilized as adhesives, coatings, paints,

dyes, as well as for medicinal purposes. Their use is described in ethnohistorical and anthropological accounts. However, many of these materials are misidentified in these accounts and subsequently in collection records, often due to problems with nomenclature. As each of these exudates is chemically distinct with different physio-mechanical and bioactive properties, correct identification is critical to understanding their use. As part of a long-term study, we are undertaking a comprehensive survey of collections from the greater Southwest from the archaeological to the historic periods. To date over 300 exudate samples from artifacts across multiple institutions have been analyzed with Fourier transform infrared spectroscopy (FTIR). Concurrently we are investigating the physical properties of these exudates to gain insight into their processing and application. Understanding materials properties combined with use patterns in artifacts is crucial to a holistic understanding of materials selection. Given the limited availability and costs of instrumental analysis, this study also assessed practical, inexpensive methods for characterizing these materials.

[258]

Chair

Biwer, Matthew (University of California, Santa Barbara) and Aleksa Alaica (University of Toronto)

[61]

Middle Horizon Cuisine: Paleoethnobotanical and Zooarchaeological Evidence from Quilcapampa La Antigua, Sihuas Valley, Arequipa, Peru

The details of how and when Wari influence reached Arequipa in the Middle Horizon can be realized through dietary patterns and cuisine. Paleoethnobotanical and zooarchaeological assemblages from the Wari-affiliated site of Quilcapampa La Antigua indicate that maize, quinoa, chuño, and camelid remains were common throughout the few decades that this site was occupied. There are distinct spatial differences in the distribution of food patterns and diachronic shifts in the way that guinea pigs were used suggesting that near the end of occupation direct Wari influence may have weakened. The botanical and faunal data also speak to the extensive mobility of populations in Arequipa during the Middle Horizon with eventual abandonment of mid-valley sites, which includes Quilcapampa. We argue that a closer examination of foodways can provide an important perspective of the influence of non-local powers. In the case of Arequipa, dietary practices were being employed by inhabitants of Quilcapampa that align with Wari traditions until the interregional interaction diminished and the site was ceremonially abandoned.

Biwer, Matthew [86] see Jennings, Justin

Blaber, Thomas [119] see Musch, Abigail

Black, Reece, Nicholas Herrmann (Texas State University) and Todd Ahlman (Texas State University)

[215]

Modeling the Past: Using Structure from Motion (SfM) Photogrammetry to Record the Sugar Works of a Station Plantation

This study utilizes Structure from Motion (SfM) photogrammetry as a documentation tool to understand the layout and usage of Site SE095, a sugar works, on the Dutch Caribbean island of St. Eustatius. The research goals are to create a spatially referenced three dimensional model of SE095, identify the foundations, extant structures, and features as they relate to sugar and rum production, and to compare the site layout to other sugar works from across the Caribbean. Agisoft Metashape Professional was used to create the model by aligning a photoset of the structural remains. These models are assessed to determine whether there are any identifiable features associated with sugar refining and rum distilling. The building configuration and organization is compared to other plantation and structure layouts from Caribbean plantations with well documented architectural features. SfM photogrammetry helps improve our recording possibilities because it creates accurate and spatially referenced three dimensional models.

Black, Stephen (Texas State University, San Marcos)

[40]

Discussant

Black, Valda (Washington State University), Marco Antonio Naveros Guizado (Universidad Nacional San Cristóbal de Huamanga), Beatriz Lizarraga Rojas (Universidad Nacional de San Antonio Abad del Cusco) and Danielle Kurin (University of California, Santa Barbara)

[224]

Bioarchaeology of Imperial Relations: Chanka and Inka Interactions at Sondor

An empire expanding into a previously established community can have significant impacts on the identity and culture of the conquered. The degree of imperial influence can vary depending on negotiations set into place between the invaders and native communities. A prominent example of these negotiations of imperial control occurred in the prehistoric highlands when the Inka rose to power during the Late Horizon (LH, AD 1400–1532). One social area the Inka targeted when incorporating communities into the empire was the alteration of their ancestor associations and behaviors (ayllu obligations), which makes mortuary studies a key part of investigations into Inka imperial influence. This project focuses on the Chanka, a culture that developed during the Late Intermediate Period (AD 1000–1400) and were known infamously by the Inka as a group of warriors they conquered in battle before expanding into the rest of the Andes. However, archaeological evidence found at the site of Sondor, in the Andahuaylas region of Peru, shows a different type of relationship between the Chanka and Inka during the LH. Here we will present preliminary findings from the recent excavations at Sondor, which shows multiple styles of mortuary behavior and ceramics, with variation seen within and between contexts.

Blackman, David, Donna Nash (UNCG) and Emily Schach**[242]***Spatial Analysis of Burial Populations at Yarakachi, Moquegua, Peru*

In 2009 while breaking ground for a new bus terminal in the city of Moquegua, a previously unknown cemetery was discovered in the area of Yarakachi. Burials from this site date from the Late Intermediate Period through the Late Horizon. Analysis of ceramics found in these tombs show that the cemetery was used by the Gentilar, Tumilaca, Chiribaya, San Miguel, Porabaya, and Inka cultures for several centuries. GIS was used to examine the location of tombs with material cultural affiliated with these different styles. In addition, analysis of the types of grave goods was examined to assess the presence of social differences amongst the burial populations. These preliminary assays will direct future research to understand the interactions between groups during the use of the cemetery and to chart any changes through time from the LIP to Late Horizon in terms of burial goods or tomb architecture.

Blackwood, Emily (University of Maine)**[194]***Applying Virtual Reality to Archaeological Analysis: Reconstructing the Ostra Collecting Station.*

The use of virtual reality (VR) to understand archaeological contexts is still new and under development. Most efforts focus on monumental, above-the-surface structures, but my research explores the potential of incorporating below-the-surface excavation data into an immersive and interactive, 3D-virtually simulated environment based on site data. Incorporating VR into archaeological analyses provides an interface in which data can be manipulated to test various research hypotheses and which can be continuously updated as new or additional data become available. The Ostra Collecting Station, a mid-Holocene site located in northern Peru, is an excellent candidate for this type of exploration; the ancient shoreline is still visible adjacent to the site, but the present-day shoreline is currently located 5km to the west. Reconstructing archaeological sites in VR allows researchers to visualize their appearance and geographic context during use and to depict the transition to abandonment much more effectively than when using traditional 2D representations.

Blair, Elliot (University of Alabama)**[29]***Making Community at Mission Santa Catalina de Gualle: A Social Network Analysis of Population Aggregation in Seventeenth-Century La Florida*

Ethnohistorical research on the Spanish mission communities of La Florida has done much to document and elucidate complicated patterns of indigenous population relocations. These migrations, aggregations, and dispersals—due to multiple factors such as epidemics, Spanish reducción policies, and flight from antagonistic native groups—resulted in the formation of complex and diverse colonial social networks. In this presentation I explore this process at Mission Santa Catalina de Gualle (GA), a seventeenth-century Spanish Mission located on St. Catherines Island, Georgia. By combining compositional analysis of glass beads and social network analysis (SNA), I explore how the circulation of glass beads played an important role in the formation of an aggregated, pluralistic, colonial community.

Blakeslee, Donald (Wichita State University)**[6]***Assessing the Intensity of Bison Processing*

Determining the extent to which sedentary people hunted and processed bison is difficult. The numbers of bison bones in habitation sites depend on a number of variables such as distance to the kill, use of bones for tools, and trade in bone tools. In addition, the hunting method used determines the visibility of kill sites. The pedestrian surrounds of the Central and Southern Plains are like the charges on horseback of the historic period; they are nearly impossible to detect. This presentation examines the feasibility of using chipped stone tool assemblages to assess a combination of volume and intensity of bison processing. Frequencies of tool types, modal forms at time of discard, evidence for hafting, and other considerations allow assessment of relative intensity of bison processing.

Blancas, Jorge [133] see Barba, Luis

Blanck, Allyson (UCLA)**[228]***A Service Dog in the Field: Accommodating Disabled Archaeologists and Nontraditional Medical Equipment*

There are many things one expects on a field site: a plethora of trowels, interns and students working away—yet it is not expected to see someone with a disability. Archaeology as a field of study often shies away from including and accommodating disabled voices, and it has created a general environment in which those with disabilities are unsure if they will be welcomed or accepted, let alone accommodated. Disability encompasses a large range of individuals, and many different types of medical equipment can accompany disabled individuals. One nontraditional type of medical equipment is a task trained service dog, which are often essential to the well-being of their handlers. In collaboration with the Institute for Field Research and the Irish Archaeology Field School, I was granted the opportunity to attend the field school at Ferrycarrig in County Wexford with my Service Dog, Bo. In this paper I will describe the process of applying to and attending a field school with a service dog, along with an introduction to the current state of disability in archaeology and theoretical actions that might be taken by other field schools hoping to engage with disabled archaeologists.

Blanke, Kimberly [187] see Cagney, Erin

Blatt, Samantha (Idaho State University)

[153]

Moderator

[153]

Discussant

Blatt, Samantha (Idaho State University), Shanda Putnam (Idaho State University), Amy Michael (University of New Hampshire) and John Dudgeon (Idaho State University)

[240]

Dark Matters of the Dark Market: Curation, Authentication, and Repatriation of Two Midcentury Shrunken Heads

Tsantsas, ritual shrunken heads (SH), were created by the Shuar of Ecuador and Peru to capture the vengeful spirits (muisak) of enemies. The postmortem artifacts were used to generate fear in adversaries, but also as means to socio-economic ends: the powerful muisak were used by Shuar men to harness and direct female labor. After the 1850s, increased European contact led to production and sale of commercial grade SH for Westerners who considered the tsantsas macabre souvenirs. Monetization and counterfeit manufacture reflects the modern practice called, "dark tourism," or the patronizing of sites associated with death. Europeans were dark tourists purchasing (what they viewed as) post-human commodities, thus driving their expedient manufacture. Two alleged tsantsas, acquired by 1950s tourists, were donated to the Idaho Museum of Natural History. The SH were analyzed using metric, morphological, microscopic, and chemical analyses of hair, skin, and fibers. Analytical tools including laser ablation-inductively coupled plasma mass spectroscopy, fourier transform infrared spectroscopy, and scanning electron microscopy revealed that the tsantsas are likely human, but with mixed ceremonial and commercial features. Determining authenticity has implications for future repatriation and/or curation and highlights the investigative role of anthropology in addressing ethical consumerism and dark tourism collections.

Blatt, Samantha [240] see Effingham, Joseph

Blatt, Samantha [270] see Peterson, Kateea

Blatt, Samantha [76] see Slane, Brittany

Blecha, Erika (Center for Big Bend Studies)

[16]

The Boulder Glyphs: An Analysis of Prehistoric Conflict and Historic Ranching Lifeways along the Big Bend of the Rio Grande

In 2018 the Center for Big Bend Studies of Sul Ross State University began a thorough investigation and documentation of over 200 petroglyphs pecked on small, vesicular basalt boulders located in the Sierra Vieja breaks, a subset of the Chihuahuan Desert near the Rio Grande in far west Texas. The recorded images on the boulders span from anthropomorphic and zoomorphic figures, to abstract geometric designs, and historic brands and initials. The variability in iconography suggests the petroglyphs were made by both prehistoric and historic individuals, offering us the opportunity to study a time transgressive phenomenon not reported from the region and with few corollaries outside of the area. The most common themes depicted on the boulders are indigenous intergroup conflict and historic brands. Geospatial analysis indicates there are patterns in the dataset, and using both ethnographic and historic county records has helped form an initial interpretation for these localized petroglyphs. This paper will discuss the preliminary analysis of these boulder glyphs, including the common themes of the images, spatial patterns, and records research.

Blessing, Matthias, Patrick Schmidt (University of Tuebingen) and Claudio Tennie (University of Tuebingen)

[162]

On the Role of Birch Tar Production in the Discussion of Cognitive Complexity in Neanderthals

Birch tar production by Neanderthals has been interpreted as one of the earliest manifestations of modern cultural behavior. This is because birch tar production per se was assumed to require a complex setup, in which birch bark is heated in anaerobic conditions. We could demonstrate that recognizable amounts of birch tar were likely a relatively frequent byproduct of burning birch bark under aerobic conditions. When birch bark burns close to a vertical to subvertical hard surface, such as an adjacent stone, tar is naturally deposited and can be scraped off the surface. The burning of birch bark near suitable surfaces provides useable quantities of birch tar in a single work session (3h; including birch bark procurement). Chemical analysis of the resulting tar showed typical markers present in archaeological tar. Mechanical tests verify the tar's suitability for hafting and for hafted tools use. Given that similarly sized stones as in our experiment are found in archaeological contexts associated with Neanderthals, the cognitively undemanding connection between burning birch bark and the production of birch tar would have been readily discoverable multiple times. Thus, the presence of birch tar alone cannot indicate the presence of modern cognition and/or cultural behaviors in Neanderthals.

Bliege Bird, Rebecca [15] see Codding, Brian

Blija, Hannah [229] see Sherman, Jason

Blitz, John (University of Alabama) and Lisa LeCount (University of Alabama)

[54]

Grinding It Out: Ancient Maya Embedded Economies and Changing Ground Stone Densities in Households at Actuncan, Belize

In Classic Maya economies, artifact distributions alone do not neatly reflect modes of production and exchange. The simultaneous

existence of multiple modes of production (domestic, specialized, ritualized, etc.) and exchange (gift giving, tribute extraction, and markets) in households complicate our understanding of the strength of any given aspect. We utilize a diachronic perspective, multiple lines of evidence, and artifact densities standardized by excavation volume at the site of Actuncan, Belize, to elucidate changes in the strength of production and exchange modes in Preclassic and Classic phases. Our focus is on ground stone densities as a measure of maize-grinding intensity across elite and common households. Data indicate that commoner households always ground more maize than elites, but intensity peaked in the Late Classic period, after which it declined. It is tempting to suggest that this pattern is linked to population decline following the collapse of Naranjo's political power over the nearby provincial center of Xunantunich. However, Actuncan demographics do not change substantially, agricultural fields show improvements, and markets continued to be held in the Terminal Classic period. Therefore, we suggest changes in maize-grinding intensity were due to the shrinking of regional political hierarchies and declining tribute demands.

Bloch, Lindsay (Florida Museum of Natural History, UF) and Emily Kracht (Florida Museum of Natural History, UF)
[196]

Production Origins of Palmetto Ware Pottery in the Bahamas

Palmetto ware is a low-fired and friable earthenware that was developed by the Lucayans after their settlement in the Bahama archipelago ca. AD 700. The production and use of Palmetto ware have been poorly understood, in part because a complete vessel has never been recovered and the vessels typically break into very small sherds. The primary identifying feature is abundant burned conch shell temper, unique to this ware. The limestone islands in the Bahama archipelago do not contain large clay deposits; instead, small pockets of clayey material develop in beach and mangrove settings. Here, we discuss an ongoing project to characterize clays available to the Lucayans in the Bahamas, and recover the "recipe" for Palmetto ware. Using mineralogical, elemental, and functional analysis, we tested a variety of clays from two islands: Great Abaco and Long Island, coupled with analysis of archaeological sherds from the same locales. Results demonstrate the Lucayans' strategic use of raw materials in a limited resource environment.

Blohm, Tre (University of Montana), Jordan Karsten (University of Wisconsin, Oshkosh), Ryan Schmidt (University of Porto, Portugal) and Meradeth Snow (University of Montana)
[244]

Paleomicrobiological Analysis of Tripolye Genomes from Verteba Cave, Ukraine

Paleomicrobiology is becoming an increasingly interesting subdiscipline of anthropology by being able to bridge the gap between archaeology and genetics in novel ways. Understanding the microbial community in the past can provide insight into human activity and cultural changes, their domesticated animals, and their environment. By analyzing the microbial classification from 106 genome samples from Verteba Cave, Ukraine, we can obtain a more comprehensive understanding of processes occurring during the Eneolithic in Southeastern Europe. This includes agriculture subsistence, large and dense settlements, and domestication, all associated with the Tripolye culture. This environment resulted in a complex bacterial environment that provides evidence for the presence of diseases in humans, animals, and maybe even plants, and aids in demonstrating the vast shifts in human subsistence and resulting ramifications of the Neolithic transition.

Blom, Deborah (University of Vermont)

[61]

Chair

Blom, Deborah [61] see Martinez, Marcos

Blomster, Jeffrey (George Washington University) and Victor Salazar Chávez (George Washington University)
[211]

The Work of Jaguar Bones and Feline Imagery at Early Horizon Etlatongo, Oaxaca, Mexico

Jaguars and other felines play central roles in origin narratives, cosmologies and political authority in Mesoamerican societies, yet actual jaguar remains and feline imagery are uncommon for the Early Horizon, from 1400–1000 calibrated BCE, especially in the highlands. Feline imagery appears in the stone sculptural corpus of the Gulf Olmec urban center of San Lorenzo, with both naturalistic examples as well as transforming figures. Feline imagery, however, has not been documented in San Lorenzo's ceramic figurine corpus, nor have jaguar bones been reported in the site's faunal corpus. At the highland site of Etlatongo, in the Mixteca Alta of Oaxaca, Mexico, recent excavations have explored both Early Horizon domestic and public space. Actual jaguar bones, possibly from the same young individual, were found in the public space where one bone had been used as a tool; this animal, or parts of it, must have arrived at the site through interaction networks. The public space also yielded ceramic figurines exhibiting feline imagery. We argue that the different media in which felines were materialized, both actual jaguar remains as well as ceramic imagery, in a public component of Etlatongo complemented and contributed to increasing complexity in cosmology, ontologies, and society.

Blomster, Jeffrey [39] see Breault, Sarah

Blomster, Jeffrey [235] see Salazar Chávez, Victor Emmanuel

Blomster, Jeffrey [189] see Vidal-Guzmán, Cuauhtémoc

Blumenfeld, Dean (Arizona State University)

[7]

Borders and Boundaries: Spatial Analysis of Urban Zones of Ancient Teotihuacan

The architectural map produced by René Millon's Teotihuacan Mapping Project allows a fine-grained investigation of two features poorly understood for ancient cities. First, I use a kernel density analysis of residential structures to assess the differential population densities of the city. There is considerable variation in local densities within the urban area. Second, I test several spatial models of settlement boundaries to investigate the periphery of the city. Peri-urban areas are the transitional zones between what is traditionally considered urban and rural. Documenting these fringe zones is crucial for understanding the effects of urbanization on rural land. This analysis opens the door for future research pertaining to urban sprawl, internal demographic variation, and spatial inequality.

Boal, Zachary (Wake Forest University) and Paul Thacker (Wake Forest University)

[36]

Magdalenian Technology and Raw Material Economy at Espadanal, Portugal

Espadanal is the only known, stratified, open-air Upper Paleolithic archaeological site buried within an aggrading floodplain context in central Portugal. Much attention has been focused on the EUP assemblages from the deepest archaeological levels of Espadanal. This poster focuses on the equally important Early/Middle Magdalenian deposits. Our lithic assemblage analysis integrated conventional study of technological organization and typology with a framework for understanding raw material selection practices. Retouched tool abundance and diversity along with extensive evidence of core maintenance and tool resharpening strategies support a working hypothesis that the location was a medium-duration campsite during the Magdalenian. Despite the very close proximity of the floodplain to the Azinheira Ridge chert source and in marked contrast to the EUP levels, Magdalenian foragers at Espadanal did not extensively reduce more massive, early-stage chert cores or manufacture large tool blanks. Artifact use-life practices and debitage analysis indicate the transport and conservation of prepared, fine-grained chert tools and finished cores to the campsite, supplemented by reduction of quartz raw material cobbles available on-site. The Early/Middle Magdalenian assemblages at Espadanal document raw material conservation within reliable technologies, indicators of highly mobile settlement strategies in central Portugal following the Last Glacial Maximum.

Bocinsky, Kyle (Crow Canyon Archaeological Center), Stefani Crabtree (Santa Fe Institute) and Sarah Oas (Arizona State University)

[171]

Notes on Biodiversity and Food Risk: A Reanalysis of Subsistence Data from the Central Mesa Verde Region

Food insecurity is a principal form of environmental risk encountered by human societies; ergo, human attempts to buffer environmental risk are often attempts to enhance food security. Here, we embark on an ambitious reanalysis of subsistence data from across the Central Mesa Verde region of southwestern Colorado. Using tools from the Digital Archaeological Record (tDAR), we integrate faunal and archaeobotanical datasets from the Dolores Archaeological Program and the Crow Canyon Archaeological Center's numerous research projects, and explore risk buffering strategies such as food diversification, niche construction, biodiversity enhancement, landrace development and maintenance, food exchange, and food storage. We use an explicitly ecological approach within a complex systems framework, where humans are embedded in nested and evolving trophic networks. We present our preliminary observations, and set forth a research program to detail ancestral Pueblo food resilience that has implications for future food security in dryland environments and beyond.

Bocinsky, Kyle [229] see Bird, Darcy

Bocinsky, Kyle [125] see Gillreath-Brown, Andrew

Bocko, Grace [167] see Wilson, Jeremy

Boehm, Andrew (Museum of Natural and Cultural History, University of Oregon)

[75]

Revisiting the Faunal Collections from Fort Rock and Connley Caves, Oregon

The earliest excavations at Fort Rock and Connley Caves, Oregon, were conducted in 1938 and 1967. Archaeologists have continued to revisit these sites in the intervening years, as recently as 2019. These sites have produced large, albeit fragmented, faunal assemblages from the Late Pleistocene to the Holocene, yet only one faunal analysis has examined the assemblages and it was limited to taxonomic identification for environmental reconstruction. However, Connolly and colleagues recently suggested that the fragmented nature of the Fort Rock assemblage indicate intentional bone breakage by humans. This project re-examines the faunal assemblages from the Cressman, Bedwell, and Connolly excavations to evaluate burning patterns, surface modification, fragmentation, and intentional breakage. The results can help elucidate the taphonomic history of these Great Basin rock shelters, improving our understanding of human and non-human processes at these sites.

Boger, Rebecca [252] see Perdikaris, Sophia

Boileau, Arianne (University of Florida)

[27]

The Inside/Outside Connection: A Spatial Analysis of Faunal Remains from Contact Period Maya Elite Structures at Lamanai, Belize

During the colonial period, the Maya living in frontier zones retained much of their community-level sociocultural and hierarchical systems. At Lamanai, Belize, recent excavations of three elite residences provide an opportunity to examine the relationship between status and animal use. In particular, one of the structures is hypothesized to be the residential compound of a Maya community head. I investigate if spatial faunal patterns can help separate Lamanai's elite based on their political status (ruling vs

non-ruling elite) and provide support for the possible identification of the Colonial ruler's residence. To do so, I compare faunal patterns among elite households and consider space use as it relates to activities involving animals. Spatial patterns are examined using taxonomic and skeletal data as well as anthropogenic modifications, such as burning, fracture patterns, and butchery marks. These methods allow me to assess whether different elite households had access to and/or controlled different sets of animal resources (both in terms of taxa or skeletal portions) and engaged in different practices involving animals and animal parts (e.g., rituals, artifact manufacturing, provisioning). Patterns revealed by other artifactual data are also considered. This study provides insight into Lamanai's sociopolitical composition during Spanish contact.

Boileau, Arianne [178] see Thornton, Erin

Boisvert, Richard (NH State Conservation and Rescue Archaeology Program)

[170]

Mike Collins in the Bluegrass: Foundations and Contributions at the University of Kentucky

Michael B. Collins began his academic teaching career at the University of Kentucky in 1971 and continued through 1982. During that time he mentored many graduate students, including this author, who went on to long and productive careers. His character, scholarship and dedication have been constant and durable as well as his humor and unforgivable punning. This paper will provide insights into his career with examples from both professional engagement and personal anecdotes with the goal of illuminating this early segment of his development as a world class scholar and archaeologist. It will come full circle with the reunion of mentor and student by way of nine expeditions of volunteers from New Hampshire to the Gault Site excavations

Boisvert, Richard [66] see Oberheim, Paul

Boles, Steve

[166]

Cahokia's Wandering Supernaturals: What Does It Mean When the Earth Mother Leaves Town

A Cahokian female figurine recovered from Ohio in 1935 was recently brought to light. Although this example is made from limestone, it is identical in all other aspects to the Cahokian flint clay suite. Additionally, the limestone was sourced to the St. Louis formation, leaving little doubt as to its origin. This example adds to the growing number of Cahokian female figurines recovered outside Greater Cahokia and a re-evaluation of their role in Cahokian religion is explored via ethnographic accounts and archaeological data.

Bolnick, Deborah [169] see Locker, Angelina

Bomkamp, Samantha (University of Wisconsin- Milwaukee)

[120]

Digging into Collections: Ceramic Analysis of Casas Grandes Vessels at the Milwaukee Public Museum

A collection of 82 ceramic vessels from the Casas Grandes (Chihuahua, Mexico) cultural region is curated at the Milwaukee Public Museum. This collection was accompanied with little to no provenance information and no research has been conducted on the materials since they came to the museum in the 1970s. Research is currently underway to bring light and information to the collection. Ceramic analysis was performed on each vessel with the use of a coding scheme recording many attributes (e.g., form, orifice, neck length, rim shape, temper, external and internal treatment, paint color, decoration, texture). Thereafter, typology and time period was determined for each vessel. Iconographical studies are currently being performed focusing on duality symbolism and human and animal icons

Bomkamp, Samantha [229] see Sherman, Jason

Bonacini, Elisa (University of South Florida), Davide Tanasi (University of South Florida), Laura Harrison (University of South Florida) and Kaitlyn Kingsland (University of South Florida)

[104]

3D Depth Sensing Applied to the Case Study of the Prehistoric "Genovese" Cave in the Levanzo Island (Trapani, Italy)

The Genovese Cave, discovered in 1949 on the islet of Levanzo in the Egadi Islands (western Sicily), has prehistoric engravings and painted art with the most complex pictures and largest cycle of depictions in the south-central Mediterranean. The red-painted figures are dated to the Late Mesolithic (ca. 7000 BC), and the black-painted figures to the Late Neolithic-Chalcolithic (ca. 3500 BC). Terrestrial laser-scanning and micro-digital photogrammetry of the entire site was performed to study the layout of the paintings and observe them from multiple viewpoints and different types of lighting. The high level of detail of the texturized 3D models is providing additional appreciation of the layout and composition of the scenes, helping particularly in visualizing overlapping scenes on stone independently by changing viewpoints and illumination. The current research suggests that the observation point and the lighting were the main factors to consider in accessing some images, and indeed obscuring others. This makes it possible to re-read the multilayered scenes depending on different viewpoints. This may reveal a path within the cave along which scenes are revealed in succession, or different areas in which the viewpoints concentrate, pointing to separate panels, perhaps marking different times of use of the cave.

Bond, Stanley (National Park Service)**[160]**

Exploring Different Confidentiality Standards between Archaeological Resources Protection Act, Section 9 and Title 54 (54 U.S.C. 307103) (Formerly National Historic Preservation Act, Section 304)

There are significant conflicts with the handling of confidential or sensitive cultural resources information between ARPA and Title 54. These are the two laws often cited when an organization or individual requests the release of archeological information. This paper will compare these two laws that exempt archaeological site information from Freedom of Information Act requests and discuss the implication of their differences.

Bond, Stanley [160] see Knox, Corey

Bond Reis, Lucas (University of Arizona)**[4]**

Southern Je Archaeology in the Itajaí Valley, South Brazil: The Tobias Wagner Site and Its Regional Context

The ancestors of the Kaingang and Laklano-Xokleng indigenous people, labeled by archaeologists as Southern Je, have been living in south Brazil since at least 100 CE. In the Itajaí Valley (Santa Catarina State), there are dozens of archaeological sites related to these people, and the Laklano-Xokleng people are still living there in an indigenous reservation. Here I present the results of the research conducted by the LEIA/UFSC team in the Tobias Wagner site, where 18 pit houses were identified and ceramics, lithics, and archaeobotanical remains were recovered. Ceramics were analyzed through FTIR and SEM-EDS to be characterized spectroscopically. Charcoal remains were identified according species (*Araucaria Angustifolia*) and genus (*Magnolia*). So far, it is knowing that this site was occupied in two periods: 900–1300 cal CE and 1600–1650 cal CE. The results are interpreted in different scales (micro, meso, and macro), and according to Zedeño's (1997; 2008) history of territory formation proposal in a long-term perspective.

Bondura, Valerie (Columbia University)**[91]**

Discussant

Bongers, Jacob [174] see Chicoine, David

Bongers, Jacob [21] see Larios, Jennifer

Bongiovanni, Rosie [169] see Izzo, Victoria

Bonine, Mindy, Katherine Seikel (AmaTerra Environmental) and Timothy Griffith (AmaTerra Environmental)**[194]**

Introduction to the Headwaters Site, New Braunfels, Texas

From mid October 2018 to early April 2019, archaeologists from AmaTerra Environmental, Inc., Texas State University and the Center for Archaeological Research at the University of Texas at San Antonio conducted data recovery excavations at the Headwaters Site (41CM204), in New Braunfels, Texas. The Headwaters Site is located on a deeply-stratified terrace adjacent to Comal Spring, which is the headwater for the Comal River. This perpetual source of water provided and attracted numerous resources for prehistoric peoples in Central Texas, who used the site more or less continuously for at least the last 8,000 years. As such, the remains of such habitations are embedded in the landscape, and excellently preserved. This paper presents the initial results from the excavations at the Headwaters Site, including the 25+ hot-rock cooking features, knapping debris dumps, stone tools, faunal remains, and unique artifacts recovered from the site.

Bonine, Mindy [176] see Seikel, Katherine

Bonthorne, Emma [240] see Fitzpatrick, Leslie

Bonzani, Renee (University of Kentucky) and Bruce Manzano (Zooarchaeological Consultant)**[254]**

Hands-on Archaeological Pedagogy: Case Example Teaching Food Pathways in Ancient and Modern Times

Active participation and hands-on analysis and activities in college level classes can draw students with diverse interests into classes of archaeology. To move away from straight lecturing about archaeological principles, the authors developed a class on paleoethnobotany and zooarchaeology which actively involves students in understanding the principles and methods of these fields of study and gives them the opportunity to analyze the archaeological remains themselves. Group work also allows them to investigate the cultural uses and nutritional values of the botanical and faunal resources identified and develop new business strategies utilizing the resources in modern markets. Students with varying majors have taken the class over the last four years. An outline of the class design and statistics on students' declared majors will be presented.

Book, Bianca (Florida State University)**[66]**

A Stable Isotope Analysis of the Archaic Windover Population's Diet (8BR246)

Carbon and nitrogen data, gathered from a stable isotope analysis, was used to reconstruct the diet of the Archaic period Windover (8BR246) burial population. The isotopes of carbon and nitrogen were selected for analysis due to their relation to the prevalent food resources found in terrestrial and oceanic settings. The sample consists of 40 fragmentary bone samples taken from the lesser trochanter of the proximal end of the femur. The femur has one of the slowest remodeling rates within the human body and will therefore produce a long term signal of diet. Twenty well-preserved women, 15 men, and 5 subadults of known age and sex were selected for analysis. The establishment of cohorts within the stable isotope analysis sample will allow the dietary results of the analysis to be compared to one another, uncovering trends in their ancient cultural practices and foodways. This study aims to produce a reconstruction of Windover diet and to uncover patterns of diet between cohorts within this population that can lend itself to their Archaic Native American culture.

Boomgarden, Shannon (University of Utah), Brendan Ermish (University of Utah), Jordin Muller (University of Utah), Duncan Metcalfe (University of Utah) and Stefania Wilks (University of Utah)

[245]

Actualistic Experiments in Archaeology: Farming and Storing Maize in Range Creek Canyon, Utah

At the Range Creek Field Station in east central Utah, researchers have had the unique opportunity to conduct repeated actualistic experiments, under modern environmental constraints, to better understand past human behavior related to farming and storing maize. This poster summarizes the goals, expectations, methods, results, and on-going difficulties of actualistic experiments designed to collect quantitative data on the costs and benefits of growing and storing maize. The data collected under modern environmental constraints is then used to better understand the archaeological record of Fremont farmers living in Range Creek Canyon between AD 900 and 1200. While we have had significant breakthroughs in understanding the trade-offs associated with irrigating with simple tools, we have had major difficulties in other areas of our experiments including pest damage to crops (primarily grasshoppers) and pests stealing food from storage granaries (primarily squirrels and pack rats). Encountering unanticipated problems and making decisions to best mitigate these issues has significantly changed our understanding of the ways past human forager/farmers would have also modified their behavior to increase their productivity. These difficulties have been extremely informative and continue to shape our experiments and future research questions.

[245]

Chair

Boomgarden, Shannon [245] see Ermish, Brendan

Boomgarden, Shannon [245] see Muller, Jordin

Boomgarden, Shannon [245] see Springer, Corinne

Boomgarden, Shannon [245] see Wilks, Stefania

Boot, Elena (Northern Arizona University)

[211]

Investigating Evidence for Child Sacrifice in Maya Lowlands

Throughout the Maya lowlands, archaeologists have recovered substantial evidence for the practice of human sacrifice. In several cases, the primary victims in these rituals were children and infants. In this presentation, I will review archaeological, iconographic, epigraphic, and ethnohistoric records for further evidence of child sacrifice. In addition to recording the context or location for these practices, my research also provides important information on the significance of child sacrifice in both time and space. It sheds light on the reasons children were chosen for sacrifice, and whether this practice was directly associated with specific Maya ideologies. The main research was conducted in Actun Tunichil Muknal cave, where I recorded the evidence for child sacrifice and compared it further with other cases of the ritual in the Maya lowlands. I also examine the Classic Maya mythology and inscriptions for the roots of the practice. Throughout the research, I test a hypothesis whether child sacrifices were associated with rain ceremonies as a tradition of considerable antiquity in Mesoamerica, especially prevalent during the Terminal Classic period in the Maya lowlands.

Borck, Lewis (University of Missouri Research Reactor)

[70]

Discussant

Bord, Arik (Texas A&M University) and Charlotte Goudge (University of Bristol)

[146]

Record or Be Forgotten: Site Visualization and Climate Change

Under most circumstances, site preservation is best when climate conditions are stable. The impending threat of climate change, therefore, presents some serious challenges for in situ site preservation and monitoring. Additionally, extreme weather events caused by climate change put otherwise stable archaeological sites at higher risk. Fortunately, advancements in photogrammetry and 3D recording technology in recent years provide an easy and inexpensive method for accurate digitization of site morphology. This presentation will discuss some ongoing and recent projects utilizing various techniques, including 3D visualization methods, to record, preserve, and reconstruct historical maritime landscapes and cultural resources and present possible future applications of the technology.

Boren, Roger

[16]

Rock Art Studies in the Big Bend Region of Eastern Trans-Pecos Texas

A sweeping curve of the Rio Grande, located in the eastern Trans-Pecos area of Texas, defines a region known as the Big Bend. The area consists of more than three million hectares or over eight million acres. The three counties of Brewster, Jeff Davis, and Presidio constitute the area of the Big Bend. This talk outlines the history of rock art observation and recordation in the region beginning with an eighteen-day wagon tour of the area by archaeologist Charles Peabody and his wife in 1909. During the tour, Peabody reported and briefly described six rock shelters, each containing pictographs. In the 1930s, there were brief areal rock art recording efforts by Forrest and Lula Kirkland and by archaeologist A. T. Jackson. From that time until the turn of the twenty-first century, various interested avocationalist and fine arts professionals have carried the mantle of rock art studies and recordation efforts in the Big Bend with varying results. We will review some of these efforts along with select representations of the diverse rock art of the region.

Borgens, Amy (Texas Historical Commission)

[18]

The Dugout and the Lost City

A chance discovery by a fisherman in late 2018 has revealed an enigmatic Texas coastal site. A 20-ft dugout canoe, uncovered by recent storm activity, was embedded in a larger archeological context suggestive of both nineteenth-century ranch features and early twentieth-century coastal developments. Research indicates the site may be associated with the John Singer Ranch—a Civil War-era settlement popularized in Texas treasure-hunting folklore for Singer's fabled lost cache of coins and jewels. Dubbed the Lost City after it was discovered eroding out of the beach in 1931, the site of the ranch remains uncertain in this dynamic coastal environment. While the discovery of this curious south Texas archeological site may begin a new chapter in this more than century-old search, it comes with the very real danger of reigniting interest in the "treasure" and looting on private and public property.

Boric, Dusan (Columbia University) and Paul Duffy (Columbia University/University of Toronto)

[135]

Chronological Perspectives on the Spread of Agriculture in Southeastern Europe

Neolithic studies in Europe have recently seen the impact of two very different sets of approaches to building chronological frameworks using radiocarbon dating. On the one hand, archaeologists have used radiocarbon dates as proxies for levels of human activity on past landscapes by employing summed probability distributions of radiocarbon measurements. This approach has tended to show little concern for the "messiness" of specific site and local level regional histories, largely focusing on the statistical robustness of large series of radiocarbon dates. The other approach has been to use a Bayesian statistical probability framework with site stratigraphies and carefully chosen contexts to build both site-specific and wider regional histories. In this paper, we evaluate the merits of these two approaches by dealing with the chronological record of the Early Holocene southeastern Europe. We discuss how the two different approaches to building chronologies stem from different and sometimes conflicting theoretical perspectives. We highlight how foragers and farmers impact landscapes differently, and how the resulting site visibility impacts each of these methodological approaches. Finally, we warn of the danger of conflating different scales of analysis when building a "big picture" by obliterating the small scale.

Borreggine, Marisa (Harvard University), Evelyn Powell (Harvard University), Richard Meadow (Harvard University), Jerry Mitrovica (Harvard University) and Christian Tryon (Harvard University)

[162]

Paleocurrents in a Least-Cost Pathway Model of Human Dispersal from Sunda to Sahul, 65–45 Kya

The timing of human colonization of Sahul, potentially as early as 65 ka (up from the previous 42 ka) has revised our understanding of the dispersal of anatomically modern humans (AMH). This movement represents, to date, the earliest known AMH long distance migration by sea, implying significant levels of complex language, marine technology, and colonization abilities. The pathway analysis applied to migration models generally utilizes a combination of eustatic sea level, low-resolution ancient topography, and/or present-day ocean currents. Using robust paleotopography and sea level reconstructions based on geophysical modeling of ice age dynamics and paleoclimate simulations using the Community Earth System Model (CESM1.1.1) and MIT General Circulation Model (MITgcm), we retrodict paleocurrents for 65–45 ka. The reconstructed ocean currents and topography determine potential pathways for migration from Sunda into Sahul. The least-cost pathway analysis applied to the migration model is a function of time at sea and island-to-island intervisibility. We seek to identify the most favorable time and path of migration into Sahul. We establish a new method for applying cost analysis to migration pathways and lay the framework for estimating paleocurrents using global and regional climate models, while also providing insight into the first peopling of Sahul.

Borrero, Luis [119] see Morello Repetto, Flavia

Borrero, Mario (University of California, San Diego), Luke Stroth (University of California, San Diego) and Geoffrey Braswell (University of California, San Diego)

[130]

Crumbling Walls: Terminal Classic Maya Collapse and Abandonment of Nim Li Punit, Belize

This paper will present a synthetic review of the Terminal Classic collapse of the Maya site of Nim Li Punit, Belize, based on new data from recent architectural excavations and artifact analysis. These lines of evidence show that around AD 800 the site saw the cessation of elite activities, the halting of new constructions, the disrepair of existing architecture, and ultimately the abandonment of the site. The data presented will illuminate the nature of abandonment of one of the major Southern Belize centers at the close of the Classic period. We will examine theories on the processes of state collapse and consider the archaeological evidence from our site and how it may fit into these narratives. Finally, we will conclude by exploring the possible internal regional dynamics of the

Southern Belize Region during this major period of social change and transformation.

[130]

Chair

Borrero, Mario [197] see Stroth, Luke

Borzic, Igor [85] see Zaro, Gregory

Boshoff, Jaco [273] see Lubkemann, Stephen

Boshoff, Jaco (IZIKO Museums of South Africa) and Stephen Lubkemann (George Washington University)

[273]

Archaeological Identification, Investigation, and Implications of the Portuguese Slaver Sao Jose Paquette de Africa

In December 1794 the São José Paquete de Africa foundered near Cape Town, South Africa while transporting over 500 slaves from Mozambique destined for northeastern Brazil, resulting in the death of over 200 souls. This presentation reviews the process through which independent lines of archaeological and archival evidence were mustered to locate and identify the shipwreck, and reviews the ongoing archaeological finds on the site since its identification. It also examines how this work is pioneering new approaches in maritime archaeology on several interrelated and mutually informing fronts, including: technical understanding of shipwreck environments and site formation processes, critical interrogations of the concept of “archaeological site” itself, and modalities of engagement with stakeholder communities including descendant communities in South Africa and Mozambique.

Boss, Olivia [38] see Fahey, Brian

Bossio, Laura (University of Michigan)

[176]

Analyzing Funerary Items and Assessing Interaction at the Williams Mortuary Complex in Northern Ohio

The Williams Mortuary Complex, consisting of a Transitional Archaic–Woodland (1000–600 BC) cemetery and associated crematory, is situated along the Maumee River of northern Ohio. Excavated in the 1970s, these sites contain diagnostic features of funerary complexes, including Red Ochre and Glacial Kame. Funerary items are here analyzed to reveal insights on interaction throughout the Great Lakes Region.

Bostwick, Todd [71] see Mitchell, Douglas

Boudreaux, Edmond, Vincas Steponaitis (University of North Carolina) and Stephen Harris (University of Mississippi) and Tony Boudreaux

[202]

Exploring the 1730 Battlefield at the Grand Village of the Natchez Indians

In 1730 an army of French, Choctaws, and other Native American allies attacked the Natchez Indians near their principal town, called the “Grand Village,” in reprisal for a Natchez attack a few months before which destroyed the nearby French colony, including Fort Rosalie. Anticipating a counterattack, the Natchez had built two forts, called Valeur and Farine, near the Grand Village. When the French arrived, they laid siege to these forts, established firing positions on and around the mounds at the Grand Village, and proceeded to dig a sap toward Fort Valeur. After several days of skirmishing, the Natchez escaped the siege and left the area. A recent study of contemporary French maps has identified the general locations of the two Indian forts, the sap, and two mounds (no longer visible) that served as French firing positions. This paper reports on geophysical surveys and excavations at Grand Village that have identified the location of one of the “missing” mounds.

Boudreaux, Tony [202] see Boudreaux, Edmond

Boulanger, Matthew (Southern Methodist University)

[30]

Lithic-Sourcing at the Crossroads: Lessons from a Half Century of Provenance Studies

Geochemical studies directed at establishing the provenance, or source, of material culture have long been part of the archaeologist's tool kit, though for much of this time the instrumentation used for these studies was the purview of specialized laboratories. Today, instruments capable of producing geochemical data are increasingly found in the hands of individual archaeologists, leading to a proliferation of geochemical-sourcing data generated on-site and in situ. The increasing ubiquity of analytical instruments spells important changes for archaeology in general, and for lithic-sourcing studies in particular. An historical perspective on the evolution of geochemical lithic-sourcing studies is potentially beneficial to helping navigate these changes. Here, I present a discussion of the development of lithic-sourcing by geochemistry over the past 60 years, casting a critical eye toward lessons that may be learned by past successes and past failings. Recognizing and acknowledging the historical context of geochemical lithic-sourcing allows us to make well-informed decisions regarding the directions in which our current research should head.

Boulanger, Matthew [55] see Jorgeson, Ian

Boulotis, Christos [196] see Tsai, Che-hsien

Bousman, Britt (Texas State University)

[19]

Discussant

Bousman, Britt (Texas State University), Kristen Wroth (Universität Tübingen), Chantel Tribolo (Université Bordeaux Montaigne), Lloyd Rossouw (Florisbad Quaternary Department, National Museum) and Michael Toffolo (Université Bordeaux Montaigne)

[162]

New Stone Age Excavations at Lovedale and Damvlei in the Modder River Valley, South Africa

In 2019 excavations were undertaken at the Middle Stone Age site of Lovedale and the Later Stone Age site of Damvlei in the Modder River valley west of Bloemfontein in the Free State Province of South Africa. Previously geoarchaeological research identified five alluvial terraces in the valley and the current preliminary excavations from these sites recovered in situ artifacts from two of these terraces. Lovedale is situated in the Lovedale Terrace that appears to date to the Middle Pleistocene. Preliminary analysis of the stratigraphy and artifacts at Lovedale demonstrates that recovered in situ artifacts are from a single occupation characterized by a unique form of MSA point, which exhibits a manufacturing process that differs from triangular MSA points resulting in bifacially trimmed bases and possible use impact-fractures. Damvlei is in the Orangia Terrace. This terrace is dated to the Late Pleistocene and Holocene at the site of Erfkroon located ~10 km downstream. The stratigraphy and artifacts at Damvlei indicate a Holocene LSA occupation that has similarities to other sites in the region, such as Baden-Baden and Florisbad. OSL, micromorphological, and phytolith samples from both sites will provide more detailed chronological and paleoenvironmental information for these occupations and the region.

Bousman, Britt [170] see Horn, Marty

Bovy, Kristine (University of Rhode Island), Michael Etnier (Western Washington University), Virginia Butler (Portland State University) and Sarah Campbell (Western Washington University)

[129]

Patterns of Fragmentation and Burning in the Ciwicen Bird Assemblage (Washington State)

Archaeological bird assemblages in the Pacific Northwest (USA) tend to receive less taphonomic investigation than mammal assemblages. An exception is Ciwicen (45CA523), a large ancestral village of the Lower Elwha Klallam Tribe, located on the shore of the Strait of Juan de Fuca, Port Angeles, Washington. As part of our large human ecodynamics research project, we explored and compared patterns of fragmentation and burning for all classes of vertebrates, including mammals, birds, and fish. Complete elements were rare for both mammals and birds, and both were more frequently burned than fish. However, there were also interesting differences between the mammal and bird assemblages. For example, murre, duck and shearwater humeri were frequently broken mid-shaft and partially burnt along the broken edges. In addition, high rates of calcined murre bones and thermal features in certain areas of the site may indicate locations where intensive seabird processing occurred. Here we discuss the 'life history' of bones from different taxonomic groups, synthesize taphonomic information on the bird remains specifically, and examine social factors, such as feasting, which may influence how bones were processed at the site.

Bow, Sierra [60] see Simek, Jan

Bowden, Taylor (Texas State University), Todd Ahlman (Texas State University), Ashley McKeown (Texas State University) and Nicholas Herrmann (Texas State University)

[215]

Exploring Free and Enslaved African Lifeways: An Isotopic Study of an Eighteenth-Century Cemetery (SE600) on St. Eustatius, Caribbean Netherlands

Multiple isotope analyses of skeletal tissues are a useful tool for exploring lifeways of past populations. Isotopic analysis of Caribbean populations is still in its infancy, making the technique a useful tool for learning about these populations. St. Eustatius is a small island in the Dutch Caribbean that served as the cornerstone for trade throughout the region. This study examines the lifeways of enslaved and free Africans residing on the island using stable isotope analysis. An analysis of diet, nutrition, and residential history of 11 individuals buried at Site SE600 was completed using carbon, nitrogen, and oxygen isotopes from bone collagen and bone bioapatite. The analysis results demonstrate significant variation in oxygen isotopic values from expected values for the region suggesting the people interred in the cemetery did not grow up on St. Eustatius. The nitrogen isotopic analysis results indicate a dependency on marine resources for protein.

Bowden, Taylor [76] see Jacobson, Jodi

Bowen, Corey (University of Illinois, Chicago) and Benjamin Schaefer (University of Illinois, Chicago)

[160]

Cultural Heritage Politics and Pokémon Go: A Preliminary Case Study of the Gamification of Archaeological Sites in Andean South America

The mega-popular Pokémon video game series challenges players to collect and train the titular creatures to compete in strategic

battles. Exploration features prominently in the games; players must traverse expansive fictional regions to advance the plot or to find one-of-a-kind Pokémon. Players may even visit archaeological sites to encounter Pokémon based on hieroglyphs, sarcophagi, or Jōmon period ceramics. In 2016, Niantic Inc. published the enormously successful Pokémon Go, which brought this same formula into an augmented reality mobile game. The virtual Gyms and Pokémon of Pokémon Go are overlain on the real world map and correspond to real locations. With prominent archaeological sites such as Tiwanaku, Huacas del Moche, and Huaca Pucllana being turned into in-game Gyms, the line is blurred between fictional sites in the Pokémon franchise and actual historical sites. This paper discusses how the unsolicited inclusion of Andean archaeological sites in Pokémon Go contributes to the Western construction of Latin America as a “postcolonial playground” that exists to be explored, discovered, and conquered by tourists. We address the tacit assumptions in the creation of virtual Pokémon Go locations out of tangible cultural sites and the implications this may have for contemporary valuations of archaeological heritage.

Bowen, Elena [268] see Muros, Vanessa

Bowers, Jordan (University of Texas, Austin)

[108]

Understanding Textile Production at Cividade de Bagunte

Textiles are a near ubiquitous feature of human society from antiquity through present-day. Unfortunately, most places around the world do not have the environmental conditions that allow for the preservation of textiles and the many tools associated with textile production. At Cividade de Bagunte, the only evidence for textile production consists of loom weights and spindle whorls, which represent only a small fraction of the tools that would have been necessary to produce textiles. In this paper, I analyze the spindle whorls and loom weights recovered during excavations at Bagunte, as well as what is missing from the archaeological record, to make broad interpretations regarding the modes of textile production at the settlement in order to understand how Bagunte's inhabitants produced textiles from raw materials.

Bowman, R. Doyle [193] see Beach, Sonya

Bowman, Robert [202] see Sattler, Robert

Boyadzhiev, Kamen (National Archaeological Institute with Museum, Bulgaria)

[85]

Tell Yunatsite, Southern Bulgaria: New insights on the Fifth Millennium BC in the Balkans

The prehistoric tell at Yunatsite in the Maritsa River valley (Southern Bulgaria) is among the biggest tell sites in the Balkans. During large-scale excavations, a Medieval cemetery, a fortification from the Roman period, and layers from the Iron Age, Early Bronze Age, and Chalcolithic have been revealed. The studies in the last years are concentrated on the thick Chalcolithic layer (fifth millennium BC). They reveal a complex settlement and social structure. The tell itself is actually the fortified part of a larger settlement that emerged around the beginning of the fifth millennium BC. Long-distance trade and craft specialization have been attested. The copper tools and pottery crucibles suggest local metallurgical production, while a small golden bead dated to the mid-fifth millennium BC is one of the earliest golden artifacts known so far in the world. The final Chalcolithic settlement was destroyed by an enemy attack around 4200 cal BC and provides important evidence for the end of the Copper Age cultures in the Balkans. The presentation highlights the most interesting results from the latest excavations and their significance for understanding the cultural processes, technological innovations and social dynamics in the fifth millennium BC Balkans.

Boyd, Carolyn (Texas State University) and Ashley Busby

[16]

Mapping the Multisensory Experience in Pecos River Style Rock Art

Pecos River style (PRS) rock art is characterized by finely painted anthropomorphic and zoomorphic figures arranged in highly ordered, complex compositions. Figures are frequently portrayed with a series of dots, lines, or a combination of the two emanating from or into an open mouth. This paper describes and analyzes the context, attributes, and image-making process of this pictographic element for 83 PRS figures. We discuss patterns in shape, color, and arrangement of the pictographic element, as well as clues to its broader semantic meaning through a study of context and the painting process. In Mesoamerica, artists used similar graphic devices to signify and activate the senses. Visual stimuli triggered auditory and olfactory responses in the viewer. Sound and scent, in the form of song, heated oratory, and aromatic fragrances, were agentive, intimately associated with creation and concepts of the soul. We suggest that PRS artists used graphic devices similarly, to transform the ephemeral and intangible qualities of hearing and smell into something enduring and palpable. Their representation in the art provides insight into the culture's conception of the senses, how they conceived and categorized reality, and how they experienced the art and the information encoded in it.

Boyd, Douglas

[192]

Buried Bottle Borders: A Nineteenth-Century German Immigrant Tradition in Texas

In 2015 and 2016, archaeological investigations at the historic Frost Town site near downtown Houston uncovered two unusual features—alignments of buried, upside-down bottles. The smaller feature had 15 in situ bottles in a single line. The larger feature had several displaced bottles and 44 in situ bottles that spanned a distance of 25 ft. and formed an L shape. The bottles are ceramic

ale and seltzer containers and glass wine, liquor, and beer bottles. The bottle types and markings all indicate manufacture in the latter half of the nineteenth century, and probable feature construction in the 1870s or 1880s. Archival and oral history evidence indicates these features were associated with German immigrant households, and they represent decorative bottle borders along the edges of flower gardens and walkways. Data have been gathered on dozens of sites in the eastern half of Texas, and these bottle gardens are a tradition strongly linked to German immigrants. Garden bottle borders have been re-created at two historic German house sites in central Texas. One historic bottle garden has survived and is still maintained by the National Park Service at the historic Oakland plantation in Louisiana.

Boyd (Starks), Jessica

[190]

Rediscovering the Past: Preservation of the Historical Collections at the Tulsa, OK, Veterans of Foreign Wars Post 577

Veterans of Foreign Wars Posts (VFWs) are overlooked resources for American history and archaeological collections. The facilities receive numerous donations from members and their families, as well as the local community, yet often lack financial resources and collection management knowledge to preserve these collections. The Tulsa, Oklahoma VFW Post 577 resides in a building that was constructed in 1920 as a National Guard Armory and in 1921 acted as a command post for the City of Tulsa during the Race Massacre. In 1946, the Tulsa VFW took over the building and has served the veteran community for over 70 years. In the last 100 years the facility has acquired a vast collection of artifacts and materials relating to local and national history. Utilizing the Standards and Excellence Program (StEPs) developed by the American Association for State and Local History, I developed a collections management system and trained post members in long term preservation of the VFW's collection.

Boyle, Peter and Janine Hernbrode

[25]

Bell Rocks and Music Making at the Cocoraque Butte Rock Art Site

The Cocoraque Butte Complex, the largest rock art site in Southern Arizona, contains over 130 boulders that ring with a distinct bell-like pitch. These boulders are distributed among the petroglyphs and show clear evidence of use during pre-contact times. Such boulders have been reported globally, but their sound properties have rarely been studied quantitatively. We recorded all bell rocks found at the site and analyzed their sound spectra to identify the fundamental frequency (i.e., pitch) characteristic of each one. The boulders resonated at a wide range of frequencies spanning three musical octaves and are positioned in such a way that musical interaction is possible. The sound of the bell rocks is clearly audible in two large areas on the desert floor, which may have served as gathering places within the group of boulder-covered hills containing the bell rocks and rock art. The petroglyphs include images associated with the Flower World, a spiritual realm that is also associated with the sound of bells. We suggest that the bell rocks at Cocoraque Butte may have been used in "participatory music" as a component of social or ceremonial gatherings, consistent with ethnographic information regarding the modern O'odham.

Bracamonte Lévano, Edgar (Museo Tumbas Reales de Sipán)

[106]

Ritual Areas in Santa Rosa de Pucará and Its Implications in Territorial and Sociopolitical Dynamism in the Lambayeque Valley, AD 650–950

Santa Rosa de Pucará is a ritual monumental area in Lambayeque Valley. Recent researches show us an increase in ceremonial practices, from 670 CE (Santa Rosa Phase 1), especially human sacrifices, changes in burial patterns, and arriving of foreign materials (obsidian, Cajamarca and Wari pottery). In Santa Rosa Phase 2 (750 CE) ceremonial architecture keeps local traditions, but Cajamarca and Wari pottery increases, and Mochica style keeps varying. In Santa Rosa Phase 3 (850 CE) occurred a drastic change in ritual areas. A D-shaped Wari structure appears, and Cajamarca pottery has striking decrease. It shows us a short time of Wari predominance, although it is not clear yet. Santa Rosa Phase 4 (900 CE) is remarked by the D-shaped structure destruction. In the other hand, orthogonal architecture, burials with different orientation, and a funerary chamber of an elite woman with Mochica patterns appear. Evidence of ritual areas points to be the main reason to generate territorial dynamism and sociopolitical transformations from mobility of population and the integration phenomenon that occurs in ceremonial activities. I will explore sociopolitical implications in Mochica local elite when Santa Rosa de Pucará got a religious prestige and became a social interaction focus.

[106]

Chair

Bracken, Justin (CUNY Graduate Center)

[265]

Maya Fortifications: Monumentality and Movement

Expanding survey coverage in recent years, using lidar along with more traditional on-the-ground and remote sensing methods, has uncovered a more extensively constructed landscape in and around Maya sites than had been realized previously. Among the most prominent and cohesive of these features are fortifications, once thought to be rare in the Maya world but increasingly seen to be prevalent in a variety of regions from the Preclassic through the contact periods. As large-scale, collaborative construction projects whose results were highly visible to the local populace, fortifications are usually monumental, and their durability ensures their continued significance across generations and even discontinuities in occupation. They thus can function as symbols of place and as conceptual delimiters of occupied space. Simultaneously, their physical attributes channel and restrict movement across the terrain, as they were designed to do. The spatial implications, both for settlement patterning and physical impact upon human movement, are investigated at Muralla de León, a small fortified site located on Lake Macanché in the Petén Lakes Region.

[265]

Chair

Bradley, Benjamin (Southern Illinois University), Joshua Cannon (Southern Illinois University), Kendra Kennedy (Southern

Illinois University), Gary Tippin (Southern Illinois University) and Kayeleigh Sharp (Southern Illinois University)
[254]

Phone-y Archaeology: Teaching Archaeology Using Mobile Apps

How might we create engaging environments that better educate and broaden the resources available in the classroom? We believe that education must focus on creating immersive experiences for the student in modern and accessible ways. This presentation discusses our digital applications made for mobile devices, along with our approach to immersive learning. Our VRchaeology project utilizes the accessibility of mobile phone applications to expose the diversity of local histories and teach archaeological principles. These applications were created with Unity and Agisoft Metashape, using augmented reality (AR), 3D virtual artifacts, 360° video, and virtual reality (VR) to teach archaeological concepts. For the past two years, our team at SIU had concentrated on developing two mobile applications. Thus far, we have developed apps focused on a precolumbian site in Lambayeque, Peru, the other based on a Freedman community in southern Illinois. Using these sites as the setting, we combine the accessibility of today's mobile technologies with hands-on curriculum to create more enriching and localized experiences. By bringing these new tools into the hands of learners, we expand the repertoire of archaeological pedagogy.

Bradley, Bruce (University of Exeter)

[170]

Discussant

Bradley, Cynthia (Primitive Tech Enterprises)

[73]

Partnership through Time: Forty-Five Years of Ancestral Pueblo Research with Bruce A. Bradley

In 1974, graduate student and rising archaeologist Bruce Bradley invited me, an aspiring physical anthropology undergraduate, to join his excavation research at Wallace Ruin, an Ancestral Pueblo site in southwestern Colorado. Little did I suspect that my uptake of this opportunity would lead to decades of joint research at this site, as well as many others. In addition to the bioarchaeological and archaeological research opportunities I encountered thereby, decades of this intellectual, and social, partnership has given me first-hand knowledge of the experiential and philosophical underpinnings that shaped Bruce's research approaches. In this session honoring Bruce Bradley's decades of contributions to a wide range of archaeological endeavors, I utilize information from Wallace Ruin to emphasize key points regarding his undertakings and perspectives about Ancestral Pueblo research specifically, archaeology in general, and the role of archaeologists in the wider world.

Bradley, Erica (University of Nevada, Reno)

[66]

The Core of Western Stemmed Tradition Technology: Exploring the Role of Bifaces as Mobile Cores by Great Basin Paleoindians

Clovis artifacts have long served as the basis for understanding Paleoindian technological organization; however, recent investigations suggest that Western Stemmed Tradition toolmakers may have employed a technological organization different than Clovis toolmakers. For instance, some authors argue that the Western Stemmed Tradition was not centered on bifacial cores, a hallmark of Clovis technology, but this notion has not yet been systematically tested. Research conducted over the past two seasons by University of Nevada, Reno's Great Basin Paleoindian Research Unit (GBPRU) at 35Ha840, a large Western Stemmed Tradition site in southeastern Oregon, offers an opportunity to test the hypothesis that large bifaces served as mobile cores. In this poster, I examine attributes of numerous sourced obsidian flake tools from 35Ha840 using methods defined by Eren and Andrews (2013). More broadly, my study contributes to our understanding of Western Stemmed Tradition tool kits and how they compare to Clovis tool kits.

Bradley, Kevin (Veterans Curation Program), Erin Cagney (Veterans Curation Program) and Scott Oliver (Veterans Curation Program)

[187]

A Landscape Revealed: Analysis of Surface Finds from Fort Delaware

From 1993 to 1996, Delaware State Park personnel conducted a shoreline survey of the quickly eroding beaches around Fort Delaware, a Civil War prisoner camp located on Pea Patch Island in the Delaware River. By the mid-1990s, erosion exposed the nineteenth-century landscape that had previously been buried, revealing thousands of artifacts and the foundations of several buildings. The southeast corner of the island, just outside the fortification walls, was used by Union forces and civilians as officer's quarters, shops, and laborer's shanties. The controlled survey of that area resulted in the collection of nearly 11,000 remarkably intact artifacts, which are currently being catalogued and analyzed for the first time by the Veterans Curation Program (VCP) in Alexandria, Virginia. This poster will present the VCP's analysis of the ceramic assemblage recovered from the survey and discuss what the material culture, along with the historic records, contributes to our interpretation of daily life in this unique setting.

Bradley, Kevin [187] see Oliver, Scott

Brady, James (Cal State L.A.)

[137]

Chair

Brady, James (Cal State L.A.)

[168]

Instrumental Neutron Activation Analysis at Naj Tunich: The Economics of Pilgrimage Production

The largest known human gatherings occur in connection with pilgrimages, a fact not lost on the geography of religion which

recognizes the power of pilgrimage centers to be important markets and to establish infrastructure around themselves. The economic importance of pilgrimage centers in Mesoamerica is well documented in the case of nineteenth-century Esquipulas and Cogolludo suggests that the sacbe system in the center of Yucatán was constructed expressly for the pilgrimage traffic to Cozumel. Ron Bishop's neutron activation analysis of the protoclassic ceramic from Naj Tunich forcefully changed our thinking about the ceramic and formed the basis of our recognition of a specialized ceramic production for pilgrimage.

Brady, James [137] see Saldana, Melanie

Brady, Ryan, Brad Comeau (Dudek), Loukas Barton (Dudek) and Nick Hanten (UC Davis)

[236]

Toolstone Acquisition in the Interior of California's South-Central Coast: Raw Material Extraction in the Mid- to Late Holocene

The use of local vs. non-local toolstone sources can reveal much about past hunter-gatherer behavior. Toolstone-acquisition-related decisions reflect past people's settlement strategy – "mapping on" or logistically exploiting a stone resource, raw material quality, and environmental productivity. Our sample of nine sites is an optimal geographic context within which to investigate patterns related to toolstone acquisition in a toolstone-rich environment. In total, Dudek excavated over 40 m³ of soil and recovered over 51,000 artifacts from sites within a 4,400-acre area. The project sites demonstrated varied strategies toward accessing and using the primary quarry sources, as well as more secondary ones. When combined with the information collected from excavated sites on adjacent properties (specifically from the coast and interior of Vandenberg Air Force Base), these data shed light on the many ways that raw material acquisition shapes patterns of regional hunter-gatherer settlement, subsistence, trade, and exchange.

Brady, Scott [13] see Sportman, Sarah

Brandon, Alan [19] see Sun, Nan

Brandt, Steven (University of Florida), Rachel Brown Reid (Virginia Tech University), Isabella Crevecoeur (University de Bordeaux), Mica Jones (Washington University, St. Louis) and Marie Matu (University de Bordeaux)

[171]

Islands in the Stream: Human Reliance on Inselbergs as Islands of Resilience and Security in Arid Late Pleistocene (MIS 2) and Holocene Somalia

Drawing upon recent lithic, faunal, bioarchaeological, and demographic analyses of curated archaeological material, our paper first highlights hunter-gatherer use of southern Somalia's granite inselbergs as "islands of resiliency and risk" during periods of extreme aridity such as MIS 2 (~28–12 cal ka) and the Last Glacial Maximum. We then consider foragers' utilization of inselbergs as relative "islands of plenty" during the semiarid "African Humid Period" ~ 15–5 cal ka. This is followed by farmer, and pastoral use of granite hills as "islands of food production" in the semiarid to arid Late Holocene. The paper ends with a brief discussion of the contemporary use of inselbergs as "islands of stability and security" in an arid, war-torn world.

Brannan, Stefan (New South Associates) and Mark Smith (U.S. Army Corps of Engineers)

[132]

Reuniting Families: The Excavation and Repatriation of Burials from the Carlisle Indian School Cemetery

The Carlisle Indian Industrial School was located on the current campus of the U.S. Army Garrison in Carlisle, Pennsylvania. The school was established in 1879 and operated until 1918. While in operation, it provided education and training to more than 10,500 Native American children in an effort to assimilate them into European American customs and culture. The Carlisle Indian School Cemetery was established for the burial of Native American students who died while attending the school, later relocated to the Carlisle Barracks Post Cemetery. Starting in 2017, the United States Army National Military Cemeteries (ANMC) and Corps of Engineers (USACE) embarked upon a program to return decedents placed in the Carlisle Indian School Cemetery to their families. In this paper, we will discuss the efforts of the ANMC/USACE to contact and coordinate with the numerous descendent families connected to the Carlisle Indian School Cemetery, describe the protocols of the archaeological exhumation and support provided to those families during the recovery of their loved ones, and examine how families have welcomed their kin home. We highlight the role that Dr. Michael (Sonny) Trimble has played throughout the project. Note: No human remains will be shown or discussed.

Braswell, Geoffrey [130] see Borrero, Mario

Braswell, Geoffrey [72] see Herr, Sarah

Braswell, Geoffrey [197] see Stroth, Luke

Bray, Tamara (Wayne State University)

[61]

The Vital Matter of Food: Reflections on Material Agency and the Intersection of Matter and Meaning

It is a basic truism that food has both symbolic and material dimensions. But anthropologists have generally tended to focus on the semantic and communicative aspects of culinary and eating practices. In this paper, I advocate for foregrounding the matter of food and its capacity to generate not only biological effects but public and social ones, as well. The notion of trans-corporeality, hinted at in various Andean texts and contexts, offers a potential way forward in thinking about the indivisible entanglement of the social and material in our engagements with food. Approaching archaeologically-defined food-related assemblages from the theoretical perspective of trans-corporeality can help to apprehend the subtle ways that biological or ecological systems entangle with social

and political ones.

Breault, Sarah (George Washington University), Jeffrey Blomster (George Washington University), Daniel Pierce (University of Missouri Research Reactor) and Michael Glascock (University of Missouri Research Reactor)

[39]

Local and Imported Ceramics from a Feasting Assemblage at Etlatongo: Preliminary INAA Results

Instrumental neutron activation analysis (INAA) conducted on a late Middle Formative ceramic sample recently excavated at Etlatongo, in the Mixteca Alta of Oaxaca, Mexico, demonstrates both local ceramic production and regional interaction with the Valley of Oaxaca. A total of 78 vessel fragments dating to the initial Late Formative (Yucuita phase, 500–300 BCE) were recovered from one feature at Etlatongo; of these, 30 were selected for INAA in order to test hypotheses about the origin of particular vessels based on their suspected provenance as determined through visual analysis, with a mix of local and imported vessels, particularly gray wares, included. INAA indicates the sample is composed of six groups, and that the vessels are predominantly of local origin. Of 30 vessels, INAA indicates that eight grayware specimens were imported from the Valley of Oaxaca. The remainder were locally produced, including two specimens that were left unassigned in our six groups. The presence of imported vessels and the proportion of local versus imported ceramics from this feature, interpreted as the remains of a feasting event, illuminates relationships between elites at this early urban center with their contemporaries in the Valley of Oaxaca.

Breiter, Sarah (Northwestern University)

[272]

The Landscape Materialized in Late Medieval Houses

Social and political ideologies are entangled in the management and control of the ecological landscape. When relations between social institutions shift, it impacts how people interact with their local environment. In this paper, I explore how these relationships are visible within the fabric of a building. During the sixteenth century and seventeenth century, English people were subject to religious conflict, political change, and a shifting economic system. Earlier institutions that governed and controlled access to natural resources had weakened toward the end of the medieval period. An emerging group of wealthy peasants, merchants, and small landowners prospered in and around many of England's market towns. They built, and rebuilt, their houses, benefiting from increased access to building materials from the local landscape. This paper explores a few of the houses built in the market town of Bury St. Edmunds. Embodied in the fabric of each building are entanglements of labor, environmental resources, and power.

[272]

Chair

Brennan, Michael [53] see King, Eleanor

Brenner Coltrain, Joan [15] see McCool, Weston

Breslawski, Ryan [55] see Jorgeson, Ian

Brewer, Jeffrey (University of Cincinnati) and Christopher Carr (University of Cincinnati)

[20]

Assessing Small Depressions as Community Quarry-Reservoirs: A Case Study from the Classic Maya Site of Yaxnohcah

Small depressions are a ubiquitous landscape feature throughout the karstic Maya lowlands. As the focus of increasing systematic study over the past two decades, these features have been assessed as serving various roles in household activities among the Classic period Maya. Ongoing archaeological and remote sensing research from the site of Yaxnohcah in southern Campeche, Mexico, examines the location, dimensions, origin, and function of eight of these depressions. Excavation data indicates that at least some of these water tanks (N=5) evolved from quarries, which were lined with a watertight seal following the extraction of limestone for building material. Lidar-directed pedestrian survey identified many additional depressions suitable for water storage, and displaying evidence of quarrying activity, close to residential structures. Supplementary water management and residential data from Yaxnohcah emphasize the spatial and temporal relationships between quarrying, construction, settlement, and water storage at the site throughout the Classic period.

Bria, Rebecca (Boston University)

[174]

Temples and Tombs, Fields and Feasts, Pots and People: Shaping a New Social World after Chavín in Highland Ancash, Peru

During the period of Chavín's religious and cultural dominance (900–500/400 BC), Andean social life was broadly shaped through interactions between religious devotees and priests, the key ritual objects and materials they brought together in temple spaces, and the stone deities in these places who mediated, if not controlled, order in the world. This paper examines the material actions through which people at Hualcayán (highland Ancash, Peru) constructed a new social world after Chavín. In particular, it considers how they created a new grounds for sociality between particular people, places, things, and deities during the Huarás phase (400–1 BC), and how these practices both explicitly contrasted and directly built upon the social relationships that undergirded Chavín society. Through a consideration of a wide variety of evidence, including Hualcayán's temple spaces, burial practices, ritual foods, ceramic forms, and feasting materials, this paper explores the methods and moments that were critical to bringing a new society into being, as well as defining who and what were essential to its creation.

Bridgman Sweeney, Kara (Georgia Southern University), Lilith Logan (Telfair Museums) and Raymond Phipps (Georgia

Southern University)**[259]***Reconciling Histories of Urban Enslaved Persons in Antebellum Savannah*

The historical and archaeological record concerning plantation-based enslaved persons in the United States is extensive, but interdisciplinary research regarding urban enslaved persons in Savannah (Georgia) is lacking. Recent salvage archaeology fieldwork focused on spaces immediately adjacent to the original subfloor kitchen of an extant building in the heart of the Savannah National Landmark Historic District. We compare archaeological evidence at a former private residence (ca. 1819–1875), to archival documentation for persons and activities at the property. Previous archival research indicates that Juddy Telfair, an enslaved cook and servant, was present at the property beginning ca. 1832. Researchers identified changes over time in varied suites of cultural material, working within and away from a builder's trench. We documented patterns of refuse disposal that are not in keeping with City ordinances in the pre-Emancipation era. Excavations to the base of the subfloor kitchen produced a large sample of Colonoware pottery (including rim, body, and base sherds). We also examined patterns in food remains (e.g., oyster, fish, chicken, cow, goat, and pig) from these same depths. These cultural deposits correspond to Juddy Telfair's documented period of service at the property.

Briggs, Emily (University of Minnesota), Lia Betti (University of Roehampton), Todd Rae (University of Roehampton), George Kamenov (University of Florida) and John Krigbaum (University of Florida)
[159]*A Multi-Isotopic Approach for Estimating the Geographic Origin of Individuals Buried in the Late Saxon Cemetery at Priory Orchard, England*

This study seeks to address questions concerning migration using a multi-isotopic approach as it applies to the late Saxon (ninth–thirteenth centuries) cemetery of Priory Orchard in Surrey County, Southeast England. Using the results from this analysis, the effectiveness of a multi-isotopic approach for reconstructing mobility within this context will be evaluated. The site of Priory Orchard was first noted in 2007 and excavated in 2014 by The Surrey County Archaeological Unit, and the human remains are currently being housed at the University of Roehampton, London. Analysis of the remains is ongoing, but thus far over 300 individuals have been identified. A random sample representative of the entire population was collected, consisting of 83 teeth including incisors, canines, premolars, and molars from a combination of males, females, adults, and juveniles. A sub-sample of 50 tooth enamel samples were taken for preliminary analysis with a preference for molars from individuals of known age and sex. All 50 samples were analyzed for carbon and oxygen, and of these, 24 samples were also analyzed for strontium and lead. The results of this study indicate that most individuals have a local isotopic signal, but with some individuals displaying values that could potentially indicate non-local origins

Bright, Lisa**[153]***Discussant***Brighton, Nancy****[132]***The Right Thing to Do: Reestablishing Relationships for New York City's African Burial Ground*

In 1991, the New York African Burial Ground was rediscovered as part of the construction of a federal office building in lower Manhattan, setting the stage for intense and extensive discussions not only about slavery and the lives of enslaved people in colonial New York, but also about collaboration with the public and descendant communities as part of federal archaeology projects. After a decade of analysis and research, there was sporadic planning for the final publication of reports, the reinterment of the individuals, and the site's memorialization. Ineffective communication between the federal government, the public, and the Howard University research team, and changes in leadership at the General Services Administration and the research team occurred as new discoveries pulled everyone in other directions. The project remained in limbo. Originally requested to help with another site, the U.S. Army Corps of Engineers, under the direction of Sonny Trimble, was asked to develop a plan with the researchers, the federal government, and the public to bring the story of the African Burial Ground home to New York City. Concentrating on the common goal of reburial and remembrance, the Corps reconnected everyone to finally realize this goal.

Britt, Krystal (University of Illinois, Chicago)**[79]***Geochemical Analysis of Mogollon Brown Ware from the Middle Little Colorado River Valley, Northern Arizona*

This poster explores Pueblo III period (1125–1275 C.E.) ceramic production practices in and around the middle Little Colorado River valley of northern Arizona. Groups occupying the region during the Pueblo III period maintained highly diverse ceramic interaction networks; however, utility ware assemblages at regional Pueblo III sites are almost universally dominated by Mogollon Brown Wares. I explore Mogollon Brown Ware production practices using a combination of archaeometric techniques, including laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS) and petrographic analysis. To date 292 ceramic sherds (corrugated Mogollon Brown ware) and 10 local clay samples from seven Pueblo III sites have been analyzed using laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS) and 55 ceramic sherds and clay samples have been subjected to petrographic analysis. In this poster I summarize the results of these analyses and explore the possibility of local production practices and unique intraregional manufacturing traditions.

Britt, Tad, David Watt (Tulane University and NCPTT), Kory Konsoer (Louisiana State University), Mark Rees (University of Louisiana, Lafayette) and Samuel Huey (University of Louisiana, Lafayette)
[9]

Risk Analysis and Mitigation Strategies for Anthropogenic Disasters along Louisiana's Gulf Coast

Anthropogenic disasters in the Mississippi River Delta have overwhelmed conventional resource management. Coastal erosion, subsidence, and sea-level rise are rapidly obliterating the archaeological record along Louisiana's Gulf Coast. A multi-institutional consortium for Mississippi River Delta Archaeological Mitigation (MRDAM) has developed a risk assessment matrix resulting in strategies to stem the ongoing loss of cultural heritage. Data recovery, salvage, site triage, regional sampling, mitigation banking, and creative mitigation represent alternative measures to be pursued in consultation and partnership with Native American tribes and coastal communities.

Brochado De Almeida, Pedro

[108]

Bagunte: Learning Behaviors from Reconstruction and Excavation

The work of excavation and reconstruction of the Cividade de Bagunte's Iron Age extant structures has revealed traces of earlier structures and refuse pits that provide new evidence and challenge previous interpretations. Similarly, the work of reconstruction and conservation has confronted us with ethical and practical dilemmas. This paper discusses how the new evidence and reconstruction techniques provide information about past human behavior.

Brock, Amanda (University of Florida) and Rosario Beatriz Pajuelo Montes (Representative of Caraz Cultura Association)
[57]

Time Narratives of Community Relationships with the Archaeological Site of Tumshukaiko

Archaeological sites are dynamic spaces that continue to be modified and transformed through the present by contemporary environments and communities who engage with them in their everyday lives. Interactions include tourism, looting, ceremonies, local historical documentation, site occupation, or storytelling of lived experiences at or around the site. By documenting these interactions and paying attention to the local relationship with the site, archaeologists may gain insight into both contemporary site transformation processes and local issues concerning the protection and preservation of the archaeological site. The following paper focuses on the local histories and contemporary interactions of the archaeological site of Tumshukaiko, which is a Late Archaic/Early Formative period (2500/2000BC) site (Bueno 2005, 49) that has been occupied for much of the Holocene through the present. Its located in the Callejon de Huaylas of Ancash, Peru and just north of the small city of Caraz in a high tourist region and dynamic environment. When considering future research plans at the site, the documentation of these stories of interaction plays a significant role in understanding contemporary and recent historical changes, identifying community issues as the basis for collaboration, and reinforcing community identity and values with the archaeological site.

Brodbeck, Mark [142] see Stewart, Caitlin

Broderick, Lee [62] see Houle, Jean-Luc

Brody, Rachel [56] see Mills, Rebekah

Brook, George [198] see Franco, Nora

Brooks, Allyson

[116]

Moderator

Brooks, Lauren

[165]

From Boom Town to Ghost Town: The Historical Significance and Cultural Impacts of Harquahala Mine

Gold and silver deposits hidden in Arizona's desert landscape have had a tremendous impact on the history and culture of the state. As prospectors discovered gold and silver near the Colorado and Gila Rivers, word of desert riches spread and itinerant miners followed mere rumors of strikes throughout Arizona, venturing out into the remote hillsides. Boom town after boom town materialized across Arizona's desert and the population of the new territory quadrupled between 1860 and 1870. Some of these settlements turned into thriving communities that are still "booming" today out in the desert, far from major metropolitan cities. Others were ephemeral, thriving only while precious metals could be pulled from the earth. In either instance, these boom towns greatly impacted the development of Arizona, both geographically and culturally. My paper will focus on these ephemeral settlements, centering on the Little Harquahala Mining District and Townsite. By highlighting Harquahala and recent surveys conducted at the site, I will demonstrate how it affected and continues to impact the culture and history of Arizona- both in its infancy as a boom town and today as a ghost town, drawing in both locals and travelers to interact with its history.

[165]

Chair

Brooks, Lauren [56] see Mills, Rebekah

Brotherson, David (University of Sydney)

[28]

Commerce, the Capital, and Community: Trade Ceramics, Settlement Patterns, and Continuity throughout the Demise of Angkor
The conventional narrative for Angkor's decline, based solely on textual sources, is problematic. While the impact of various environmental, political, cultural, and economic factors is debated, the date range and manner in which Angkor depopulated are yet to be identified archaeologically. Traditionally, studies of Angkor have focused on architecture, statuary, and epigraphy. More recently, research has considered the environment, landscape and nonelite forms of material culture. This research focuses on ceramics as a proxy for residential occupation and identifies temporal and spatial patterning in a representative assemblage. From 2012 to 2014 the Greater Angkor Project conducted the first systematic survey of the habitation mounds of Angkor, from the urban core to the periphery. A surface collection of diagnostic ceramics was collected. The bulk of the material was Khmer, but tradewares from China, Thailand, and Vietnam function as crucial temporal markers, especially for the post-fourteenth century. Ceramics analysis confirms a significant drop in cultural material in the fifteenth–sixteenth centuries, and an influx of lower quality utilitarian wares in the eighteenth–nineteenth centuries. While Angkor may have lost its strategic importance, a residual population still engaged with an international trade network as it flourished.

Brouwer Burg, Marieka (University of Vermont)

[14]

Modeling Preceramic Occupation around the Wetlands of the Low-Lying Coastal Zone

The Preceramic period in Mesoamerica (c. 7000–2000 BCE) is often characterized as a transition from hunter-gatherer Paleo-Americans to emergent farming communities. Most Preceramic finds occur on the surface and lack archaeological context. However, during a 2017 field season a dense in situ Preceramic deposit was identified at the Crawford Bank site on the shore of the Crooked Tree Lagoon in the low-lying coastal zone of northern Belize. This site contains a rich and distinctive deposit of Preceramic stone tools and freshwater shell artifacts suggesting that these foragers adapted uniquely to this regional wetland microenvironment which lacks arable land but is rich with fish, Mollusca, and durable Logwood resources. Lithic use-ware analysis suggests wood-working activities and finds of a barbed Lowe point (likely hafted to throwing/thrusting wooden spears) suggests spearfishing activities. Combining the archaeology with multiple geospatial technologies, the evolution and nature of these intimate human-environment interactions is examined. Modeling a range of paleoenvironmental data against the distribution of Preceramic tools from Crawford Bank and other parts of this low-lying coastal zone provides a potential means for predicting where fishing and incipient agriculture developed, in some cases separately, as key adaptive strategies during this transitional period in prehistory.

Brown, Alexander (Panamerican Consultants)

[231]

"Party Theory" and the CRM Dataset

"Party Theory", as presented here, draws from a performance-based perspective, seeking to integrate localized social behavior of individuals in virtually instantaneous timeframes (essentially "events") within interactive frameworks at broader scales. The micro-scalar definition of inter-personal interaction and the material engaged in this activity seeks to understand a more or less real-time attribution of significance to material; it is hoped that this understanding will inform the scholar's attribution of significance to materials, which forms the basis of more economic network models of interaction at the inter-regional scale over the longue-duree. This approach can make singular use of the massive dataset provided by American cultural resource management; for example, temporal sites of historic farm buildings and pre-contact lithic scatters rarely see intensive academic investigation, yet can provide insights into how certain materials can incite or enable the inter-personal interaction that aggregates into the broader flow of social activity over time. This paper explores the possibilities of populating our macro-historical frameworks with the real activity of isolated events.

Brown, Clifford [126] see Neff, Hector

Brown, David (University of Texas, Austin)

[201]

Squaring the Circle: Settlement Planning in the Late Prehistoric Northern Ecuadorian Highlands

While urban planning is present in many early state societies, pre-state settlement planning is not uncommon in chiefdoms, as seen in Mississippian societies of the southeastern U.S. In Ecuador, planned arrangements of circular mounds can be seen on the coastal plain and the western slopes, though little is understood of their functional relationship to those societies. The near absence of excavated village areas in the northern sierra of Ecuador limits the study of village planning but occasional clustering of Integration period mounds between AD 700 and 1500 suggests these features could mirror aspects of social organization. Late Integration planning in the large monumental center at Cochasquí and contemporaneous sites might reflect still more complex social developments during the latter part of that period. In these cases, the planned integration of mounds into agricultural spaces and the integration of truncated pyramids into larger, coherent complexes imply an increasingly hierarchical society. If the construction of monumental centers were intended to impress the citizenry and attract new adherents, then Cochasquí may well have been in competition with large rival centers like Zuleta to strengthen their regional power bases during the stressed environments of the Early Little Ice Age in northern highland Ecuador.

[201]

Chair

Brown, David [201] see Ortiz, Byron

Brown, Emily (Aspen CRM Solutions)
[266]

"They Made Many Tunes": Musical Instruments of the Pueblo Peoples of the Northern Rio Grande Valley

The distributions of different types of musical instruments across the American Southwest have been generally defined, but little work has been done to tie these data to studies of ethnogenesis, migration, and language groups. This paper examines archaeological, musicological, ethnographic, and historical data on instruments from archaeological sites from the Four Corners area and northern New Mexico in the context of what is known about the movement of different culture and language groups. It presents a more fine-grained analysis of instruments such as wooden and bone flutes, bone whistles, bone and shell tinklers, gourd rattles, clay and stone bells, and bone rasps as they relate to the language groups of the Pueblo peoples of the northern and middle Rio Grande Valley.

Brown, Erin (Carson National Forest), Maria Jonsson (Carson National Forest) and Travis Kern (Carson National Forest)
[214]

Then and Now: A Photographic Essay of the Civilian Conservation Corps on the Carson National Forest

After the Great Depression the Civilian Conservation Corps (CCC) was needed to help citizens across the United States regain their economic footing and help the environment recover from overuse and devastating drought. It was a time of great change for both the American People and the environment that would continue to affect the lives of following generations. This photographic essay is a comparison of historic and modern photographs, and sketch maps collected throughout the past 86 years of CCC camps and CCC work projects on the West Zone of the Carson National Forest, New Mexico. These recordings give us a snapshot in time that improve our understanding of how these men shaped the world around them, how land management was changed during and after the Great Depression, and how the CCC had a lasting impact on the landscape.

Brown, James (Washington State University), Douglas McFarland (Pacific Northwest National Laboratory), Zach Allen (Central Washington University) and Steven Hackenberger (Central Washington University)
[8]

Early Holocene Paleosol and Associated Sea Level Estimate for the Southern Salish Sea of the Central Northwest Coast

Early Holocene Salish Sea levels ranged from 10–15 m below current sea level. Sea level rose sharply before 7,000 years ago and then slowed. Sea levels are better documented for the Gulf of Georgia than the Puget Sound. Reports in 2014, originating from the construction of a light rail transit system in Tacoma, Washington, proposed that cordage found in drill cuttings was associated with a 7,800-year-old paleosol, deeply buried below marine sediments and the 5,700-year-old Mount Rainier lahar deposits (Osceola Mudflow). In 2016, six additional boreholes recovered no artifacts. In situ sediment samples from those boreholes were analyzed using magnetic susceptibility (MS), particle size analysis, and XRF. Data confirmed that a mature paleosol is buried at a maximum depth of 25 m below surface, and a more recent paleosol is buried 3 m below surface. MS and other data suggest that the deeper mature paleosol developed over a period of 3,000 years. Sea levels for this locale during the early Holocene may have been 3–4 m lower than previously proposed. These findings must be reconciled with the 1.5–4 m subsidence hypothesized for locales south of the Tacoma Fault Zone 1,000 years ago.

Brown, James (Northwestern University)
[47]

A Brief History of Mississippian Period Art Styles in the American Southeast

Focused stylistic analysis over the past 60 years has made clear that graphic depiction of the creator forces became a vehicle of artistic expression for southeastern societies. Between 1200 and 1400 expression was nearly ubiquitous by including, without being confined to, pottery surfaces, marine shell, sheet copper, and stone sculpture. Distinct styles arose within major territorial spaces that entered into "conversations" with each other. Thus structural parallels arose. Each was tied to a distinct life-world that was not interchangeable with others. These life-worlds are subject to analysis.

Brown, Jordan [140] see Maher, Lisa

Brown, Kaitlin (University of California, Santa Barbara)
[239]

Exploring the Waning Spanish Frontier at Mission La Purísima Concepción

Although often viewed as one phase in California history, the Mission period encompasses multiple social and economic shifts that had transformative effects on local indigenous populations. Whereas the initial goal of the Spanish mission system was to make indigenous peoples into loyal subjects, new policies under Mexican rule called for social equity among all ethnic groups—as outlined in historical documents such as the "Plan de Iguala." In this paper, I explore how the Chumash of south-central California navigated these crucial shifts in colonial policy using archaeological materials from Mission La Purísima Concepción located in Lompoc, California. Previous research has identified two distinct stratigraphic/chronological contexts that date to both these periods. Using existing collections and recent archaeological investigations during the summer of 2019, I discuss similarities and differences in labor practices, trade and exchange, and spatial organization among the single Chumash community that lived at the Mission over time.

Brown, Kaitlin [239] see Rotella, Brianna

Brown, Kelly [187] see Howe, David

Brown, Kenneth

[40]

Sampling for Snails at Genevieve Lykes Duncan

Snails are moisture-sensitive organisms, so systematic sampling for snails was done in 2013 as part of the multiproxy set of paleoenvironmental studies done at Genevieve Lykes Duncan. A 2.74 m long column of sediment samples was collected from the arroyo wall, extending from the surface to below the principal occupation zone. The column spans the entire Holocene, but cuts only partway into the lower gravel bar, not penetrating Younger Dryas sediments. Thirty samples at 10 cm intervals produced 451 kg of analyzed sediment and 874 specimens, wet-sieved through nested 2 mm, 1 mm, and 0.5 mm sieves. Specimen density is low (about 2 sp/l), taxonomic diversity is low (7 taxa), no large-bodied terrestrial taxa are present, and at least three of the four terrestrial taxa are arid-tolerant habitat generalists; among these, age profiles vary by species. Aquatic taxa (nearly all juveniles) are present only in the bottom half of the profile, disappearing in the upper gravel. Like the terrestrial taxa, these are resilient habitat generalists, suggesting the creek consisted of shallow, stagnant pools with low flow. This study suggests this lowland basin aridified quite early in the Holocene, earlier than surrounding higher elevation regions.

Brown, Linda [127] see Jackson, Sarah

Brown, M. Kathryn (University of Texas, San Antonio)

[158]

Preclassic Foundations in the Mopan River Valley, Belize

Our understanding of the Preclassic landscape in the Mopan River valley has increased dramatically over the past two decades suggesting a more robust population present than previously thought. Our earliest evidence of human occupation in the Mopan valley dates to the archaic period. Early ceramic producing communities were present by 1000 BC as seen from Cunil phase ceramics found deeply buried at Xunantunich, Actuncan, and hinterland sites. Early public architecture in the form of E Groups emerge on the landscape during the Middle Preclassic period as seen at Early Xunantunich and Las Ruinas de Arenal. During the Late Preclassic, E Groups and other monumental architecture become more widespread laying the foundation for Classic period construction efforts. This paper presents our current understanding of the Preclassic landscape and charts the pathways to complexity in the Mopan valley.

[158]

Chair

Brown, M. Kathryn [158] see Horowitz, Rachel

Brown, M. Kathryn [185] see Yaeger, Jason

Brown, Mary

[60]

Rock Art Communication Processes: Reconceptualizing Form, Function, and Framework

Rock art is an artifact, yet it is analyzed as artwork. Two-dimensional forms confound many traditional archaeological methods. Thus, research questions are restricted to formal attributes and the stylistic comparison of subject matter. As a result, rock art sites are largely ignored by the archaeological community in favor of those possessing 3D artifacts such as lithics, ceramics, and architecture. This has direct implications for constructing a viable methodology to tackle questions about rock art production and use. Rock art acts as a conduit for human/object, human/location, and human/nonhuman communication processes. Evaluating such processes necessitates reconceptualizing rock art as an image-object. Behavioral Communication Theory presents the best framework for analyzing the artifact's visual and non-visual performance characteristics as communication processes. The broad applicability of the framework is demonstrated by comparing two rock sites in southern New Mexico. This comparative analysis reveals how a behavioral communication approach allows us to break free from the limitations of 2D approaches to tap the data potential of rock art sites in New Mexico, and beyond.

Brown, Matthew [61] see Belisle, Veronique

Brown, Robert [104] see Tanasi, Davide

Brown Reid, Rachel [171] see Brandt, Steven

Browne, Cameron [175] see Crist, Walter

Brunelle, Andrea [66] see Hart, Isaac

Bruniaux, Guillaume [107] see Lueth, Friedrich

Bruno, Maria (Dickinson College), Christine Hastorf (University of California, Berkeley), Sherilyn Fritz (University of Nebraska), José Capriles (Penn State University) and Alejandra Domic (Penn State University)

[59]

Persistence in the Face of Change: Integrating Paleoenvironmental and Archaeological Datasets from the Southern Lake Titicaca Basin of Bolivia

The southern basin of Lake Titicaca is a key location for paleoenvironmental and archaeological research into past human-climate dynamics in the Andes. This shallow basin is particularly sensitive to climate change: in dry periods the lake level falls, in wet periods it rises. The basin is also rich in archaeological sites dating to the first settled agro-pastoral communities 4,000 years ago through the development of complex societies, particularly the Tiwanaku state. The first generation of researchers here documented broad trends in climate and societal change. Here we integrate fine-grained datasets of diatoms from lake cores as well as patterns in plant and animal remains recovered from excavations by the Taraco Archaeological Project. Rather than attempt to identify where major changes “match up” between datasets at particular moments in time, we take a broader look at the tempo and scales of change that people and landscape in the basin experienced between 4,000 and 500 years ago. We find that high variability in wet/dry climates and lake levels was actually the norm across this time; yet, we find the construction of a socioenvironmental system characterized by the persistence and resilience of subsistence practices, particularly through a combination of fishing, herding, and farming.

Bruno, Maria (Dickinson College)

[88]

Discussant

Brunso, Karen

[49]

Control Alt Repatriate: Using NAGPRA CUI Regulations to Regain Our Culture

The NAGPRA CUI regulations provide a key tool for tribes to repatriate their ancestors. CUI allows tribes to use their traditional knowledge to show their connection to their ancestors in the NAGPRA process. This traditional knowledge has made some archaeologists very uncomfortable due to the lack of “scientific data” to provide a connection to collections. However, the CUI regulations affirm that the connection tribes feel to these ancestors is significant and cannot be ignored. Through CUI's affirmation, tribes are beginning to take control of their ancestors and their culture.

Bruwelheide, Karin [173] see Owsley, Douglas

Bryant, Jeff (SUNY Albany) and Jeffrey Glover (Georgia State University)

[271]

Comparing Coastal Subsistence and Inland Trade of Marine Fish, Using Otoliths from the Ancient Maya Sites of Mayapán and Vista Alegre

Otoliths, or fish ear-stones, offer tremendous data potential on fish species, coastal ecology, fish demography, and the harvest behaviors of ancient people. To explore which species may be selected for inland transport versus coastal consumption, this paper compares the species composition of fish at Mayapán, with those collected at the site of Vista Alegre, excavated by the Proyecto Costa Escondida. Issues of differential preservation and recovery methods are explored, with a focus on otolith-to-body-size ratios of fish are affected by ecosystem type, and how the species recovered can affect our understanding of available fishing technology and behaviors. Recommendations will be offered on future directions for archaeological otolith studies.

[271]

Chair

Bryant, Paula [213] see Meierhoff, James

Bryant, Paula [160] see Porubcan, Paula

Bryce, Joseph (Brigham Young University), Spencer Lambert (Southern Methodist University) and Brady Robbins

[148]

Worked Bone Gaming Pieces among the Fremont: A Case Study from Wolf Village, Utah

Worked bone gaming pieces likely served an important role at Fremont communal structures. In this research, we present our findings on recreating the life history of Fremont gaming pieces at Wolf Village, a habitation site in northern Utah. Previous studies have hypothesized that the Fremont at Wolf Village blended both gaming and ritual. The context of the Wolf Village gaming pieces supports this hypothesis, since many gaming pieces were expediently made and deposited within a thick midden overlying a large communal structure at the site. By evaluating the life history of Fremont worked bone gaming pieces—including recreating their stages of production, potential uses, and disposal contexts—archaeologists can better understand the function of these artifacts among the Fremont.

Bryce, William [229] see Harte, Marybeth

Bryce, William [69] see Whittaker, John

Bryne, Stephen (ICF) and Shane Sparks (ICF)

[252]

The Pitas Point Site: A Chumash Village Site in Ventura County, California

The Pitas Point site (CA-VEN-27/240), a named Chumash village during the late prehistoric period, is located on the southern central coast of California. First recorded in 1960, the site was excavated by a team from the University of California Los Angeles in 1969–1970 for the realignment of the U.S. 101 highway. A full excavation report was never produced but a summary article of the previous work and results was published in 1983 (Gamble 1983). Recently, archaeologists from ICF revisited the site during the Seacliff Siding Project conducted for the Federal Rail Authority and the California Department of Transportation, District 7. The site was in danger of being impacted by the construction of a railroad track siding by the Union Pacific Railroad (UP). Following a study and recommendations by ICF, UP redesigned the project and shortened the siding in order to avoid the site. The authors and the paper discuss the ethnographic and environmental setting of this important Chumash village site and summarize the previous investigations conducted at the site and the recent project.

Buchanan, Briggs (University of Tulsa), Danielle Macdonald (University of Tulsa) and Kyleigh Royal (University of Tulsa)
[17]

Evaluating the Effects of Parallax in Archaeological Geometric Morphometric Analyses

Geometric morphometrics is a powerful set of techniques that can be used to visualize and analyze the shape of artifacts. With the growing use of GM in archaeology it is critical to understand limitations in the way it used in our field. One such potential limitation is parallax, or the effect of the position of an object in relation to the camera. We designed an experiment to assess the effect of increasing parallax by photographing artifacts at close range (50 cm) and systematically shifting the fixed angle of the camera in four steps: 0°, 5°, 10°, and 20°. We took digital images of 30 microlith artifacts from three Jordanian sites at each of the camera angles. We then digitized the outline of each artifact using 24 landmarks. Our subsequent discriminate analyses of microlith shapes grouped by camera angle shows that they are statistically indistinguishable from each other, which suggests that within these parameters parallax has little effect. While taking digital images directly above artifacts is ideal, the angle at which previously published photographs of artifacts is sometimes unknown. Our findings suggest that this is not problematic, as variation in camera angle does not significantly alter images for use in GM analyses.

Buchanan, Briggs [26] see Hamilton, Marcus

Buchanan, Briggs [232] see Mraz, Veronica

Buchanan, Briggs [236] see O'Brien, Michael

Buchanan, Meghan (Auburn University)

[70]

Discussant

Buck, Caitlin and James Zeidler (Colorado State University)

[24]

Tephrostratigraphic Correlation and Ceramic Seriation in Bayesian Calibration: A Case Study from Coastal Ecuador

The radiocarbon record from sustained archaeological field research in the Jama Valley of coastal Ecuador has provided a robust dataset for Bayesian chronological modeling using multiple archaeological sites from a valley-wide landscape (Buck et al. 1996:226–232; Zeidler et al., 1998; Buck and Zeidler, in prep.). This paper delves into greater detail on the development of the model's prior probabilities that utilized iterative multi-site stratigraphic sampling coupled with ceramic seriation for correlating key events (volcanic ashfalls) and longer phases of cultural occupation across the valley landscape over 3,600 calendar years. While correlation of three principal volcanic ashfalls (tephras) was straightforward in most cases and greatly aided in the initial Bayesian modeling, recent tephrochronological studies on a macroregional scale have identified additional tephras in the Holocene stratigraphic sequence of the Jama Valley that are not readily identifiable in sampled archaeological contexts. Two possible reasons for this are identified, the first being closely spaced volcanic eruptions, depositing different tephras in rapid succession, and the second being cryptotephra in archaeological contexts that may have resulted from human disturbance processes. Potential solutions are proposed that involve new techniques for in-field analysis of volcanic sediments using hand-held laser-induced breakdown spectroscopy and/or X-ray fluorescence instrumentation.

[24]

Chair

Buck, Caitlin

[135]

Discussant

Buck, Caitlin [24] see Moody, Bryony

Buckley, Hallie [62] see Vlok, Melandri

Buckley, Michael [212] see Harvey, Virginia

Buckley, Michael [244] see Johnston, Elizabeth

Buckley, Michael [120] see Pal Chowdhury, Manasij

Budar, Lourdes (Universidad Veracruzana), Sara Ladrón de Guevara (Universidad Veracruzana) and Mauricio Cuevas (Universidad Veracruzana)
[227]

El pluralismo cultural de Los Tuxtlas a través de sus conjuntos escultóricos

La sierra de Los Tuxtlas, se encuentra ubicada al sur del actual estado Veracruz. Investigaciones arqueológicas recientes han demostrado que existe un complejo sistema portuario prehispánico que se interconecta a través de todo el Golfo de México. Durante el desarrollo de esas investigaciones se han registrado evidencias arqueológicas que permiten identificar una variabilidad muy marcada de patrones culturales provenientes de diferentes partes de la Costa del Golfo. En este trabajo se discutirán los rasgos estilísticos y los contextos del corpus escultórico de la porción oriental de Los Tuxtlas, con el objetivo de distinguir atributos que nos permitan diferenciar y asociarlos a diversas tradiciones de representación durante el periodo Clásico mesoamericano, con el fin de evidenciar los procesos de pluralismo cultural en la región.

Buehlman-Barbeau, Savanna [243] see Carline, Kristin

Buenger, Brent [62] see Gardner, William

Buffington, Abigail (William & Mary)
[125]

Palm Reading: Palm Tree Stands as Cultural Landscapes in Arid Zones

Palm trees are the anchor species that enable agro-systems to work in arid environments, like South Arabia. These plants thrive in hot, dry climates with high water tables, where they create microclimates (lowering the evapotranspiration, improving soil infiltration, and increasing nutrient integration within soils). These altered growing conditions support other vegetation, much of which would otherwise fail to survive under the general conditions. Recently, agronomists in the Arabian Gulf region have explored the potential of palm-founded oases to combat processes of desertification. In addition to creating the conditions supporting food production, these trees are exploited for a high number of consumptive and craft practices, often maintaining a high cultural value. How old are these landscape systems? These social systems? Biologists are still determining the biogeography, and where appropriate the domestication history, of most palms through DNA analyses. In South Arabia, there are at least four native palms (Phoenix, Hyphaene, Nannorrhops, and Livistona), all with ethnographic evidence of exploitation. This paper will present new palm morphotype identifications from a phytolith (amorphous silica plant proxies, deposited in sediments post decay) study conducted on paleoenvironmental and archaeological samples from southeastern Yemen and dating to the Arabian Neolithic (10–5 kya).

Buikstra, Jane [169] see Bey, Bridget

Buikstra, Jane [264] see Doubles, Catherine

Buikstra, Jane [260] see Schach, Emily

Bukhchuluun, Dashzeveg [62] see Janz, Lisa

Buller, Justin and Andrea Gregory
[132]

Challenges in the Recovery of Historic Military Cemeteries

In 2013 the City of New York discovered two abandoned Army cemeteries directly in the path of critical infrastructure projects and requested that the Army take responsibility for recovery of the persons buried in the cemetery. Headquarters Department of the Army (Office of Army Cemeteries) responded by having Dr. Michael "Sonny" Trimble lead the effort to promptly recover the remains in a dignified manner. This paper focuses on the complexities and challenges of executing such a challenging project due to limited budgets, extremely tight time frames, the very public location of the cemeteries, and numerous players involved in the planning and execution.

Bullion, Elissa (University of Pittsburgh) and Sean Greer (University of Missouri)
[261]

Perceptions and Care of Disability in Early Islamic Central Asia

In this paper, we apply an index of care approach to a case study of an individual with Progressive Pseudorheumatoid Dysplasia from an early Islamic cemetery at the site of Tashbulak in southeastern Uzbekistan. Joint degeneration and progressive impingement of nerves would have severely limited individual TBK_Br08's ability to eat, drink, and stay clean. We situate this individual's needed care within the context of Islamic philosophy and contemporary medical approaches with regards to disabled individuals. The Qur'an and Sunnah address not only the importance of caring for 'disadvantaged people' by all Muslims, but also their rights within society, including marriage and ownership of property. The Tashbulak individual was cared for over a period of several years, and despite requiring increasing levels of care, and lived at least into early adulthood. In death, TBK_Br08 was buried according to Islamic prescription, in the same manner as other, non-disabled individuals at Tashbulak. Much research on early Islam in Central Asia focuses on the where and when of the religion's spread. This paper examines the human dimension of early Islam in Central Asia, and creates a framework for future studies of disability in the early Islamic world.

Bunce, Michael [19] see Linderholm, Anna

Buonasera, Tammy (University of California, Davis)**[83]**

Considering Women's Tech Choices: Grinding Efficiency and Performance Characteristics of Hunter-Gatherer Milling Tools
Milling tools were a cornerstone of many plant-based hunter-gatherer economies. Women are often involved in food processing and would have used these tools, in some cases daily, to expand the breadth of foods available for consumption. Despite their important economic role, few studies have compared differences in the performance of various ground stone designs common to hunter-gatherers in California, or elsewhere. Here, experimental small seed and acorn/nut processing rates are compared for three mortar and two grinding slab designs. Results indicate some unexpected relationships between different interior mortar shapes and seed processing. In particular, large mortars with deep and broad interiors are highly effective tools for producing flour from both small wild seeds and acorns. Though expensive to manufacture and transport, mortars with large bowl-shaped interiors would have been excellent for long-term use in settings where multiple types of plant resources were processed into finer particles. Conical mortar shapes are good for acorn processing, but poor for processing small seeds into flour. Shallow mortars and small grinding slabs are the least productive but least expensive tools.

[83]

Chair

Buonasera, Tammy [83] see Goring, Daniel

Buonasera, Tammy [83] see Zhang, Peiqi

Burentogtokh, Ja [62] see Gardner, William

Burger, Rachel (Southern Methodist University)**[129]***Birds as Thought: Avifauna and Coalescence at Sapa'owinge in Northern New Mexico*

The diversification of avifauna in Pueblo IV (AD 1300–1600) assemblages is widely recognized as a marker of the ceremonial elaboration that accompanied the coalescence of groups into large ancestral Pueblo settlements. Archaeologists have argued that such rituals were integrative, but this assumption downplays the ecological aspects of religion and the context within which it developed. Using perspectives derived from zooarchaeology and ethnohistory, this paper examines the relationship between birds and humans at Sapa'owinge (LA306), an ancestral Tewa site in northern New Mexico. Analysis of the faunal assemblage shows that birds were food, had ritual meaning, and supplied the tools for ritual acts. Avifauna diversity and use was highest leading up to peak occupation, supporting the use of birds for community security in late prehistoric Pueblo populations. These patterns can further our understanding of Tewa animal management, ritual practices, and of birds as an expression of Tewa worldview.

Burger, Richard (Yale University)**[174]**

Discussant

Burger, Richard [182] see Salazar, Lucy

Burgio-Ericson, Klinton (University of New Mexico)**[165]***Pecking in Strange Places: Rock Art and Seventeenth-Century Zuni Missions*

Prehistoric rock art of the Southwest has been subject to significant surveying and study, but much of this scholarship overlooks examples pertaining to the Spanish colonial period and missionary activities. This talk considers two petroglyphic slabs from the collections of the National Museum of the American Indian, which were once incorporated into Franciscan mission structures at the ancestral Zuni pueblos of Hawikku and Kechiba:wa in western New Mexico. Drawing upon the particularities of individual artifacts to open broader considerations of rock art as a component in the colonial built environment, careful examination of the Zuni petroglyphic slabs suggests that their incorporation in the missionized pueblos was neither accidental, nor manifested simple syncretism or assimilation. Rather, each of these artifacts evidences the work of multiple hands, and points to active strategies of subtle resistance to conversion and assimilation, yielding hybrid objects at the intersection of Spanish and Pueblo cultural systems. Details of the slabs' construction and interpretive insights from descendant community members indicate subtextual reiterations of Zuni cultural identity in the face of colonial pressures, helping to contextualize the mission petroglyphs and offering evidence for the strategic agency of individual Native artists under Spanish rule.

Burham, Melissa (University of Arizona)**[128]***Social and Political Collapse, Resilience, and Transformations in the Protoclassic Maya Lowlands: A View from Ceibal, Guatemala*

During the Protoclassic period (ca. 100 BC–AD 300), many centers across the Maya lowlands collapsed while others thrived seamlessly into the Classic era. This paper draws on evidence from minor temple groups around the epicenter of Ceibal, Guatemala, to explore how populations participated in the formation of complex social and political systems, and how they responded to periods of instability. Recent evidence suggests populations were organized into discrete, heterarchically-oriented corporate groups during the Late Preclassic (ca. 350–100 BC) and Protoclassic periods. In the face of social unrest, these groups terminated their local temples and abandoned the city, leaving a power vacuum for a small population residing in the epicenter. As Inomata et al. (2017) explain, the Ceibal dynasty emerged during this period of decline, perhaps under the auspices of more powerful kingdoms in Central Petén. I examine how outlying corporate groups simultaneously constrained and laid the foundation

for a truly centralized ruling body. The physical and political infrastructures established during the Protoclassic, combined with the absence of competing leaders, may have been key to Ceibal's re-florescence in the Classic period.

[128]

Chair

Burke, Adam

[30]

The More the Merrier: Using a Suite of Analytical Techniques to Arrive at Reliable Chert Ascription

Determining the provenance of Florida cherts has been a major goal of archaeological researchers in the state for decades, and inquiry has largely focused on refining the existing petrographic and microscopic methods. When these methods of provenance were first developed, geochemical approaches using X-ray fluorescence spectrometry (XRF) were tested and determined to have little application for reliable chert characterization. While this early research demonstrated that XRF was not an appropriate method for characterizing Florida cherts, other research has shown that Instrument Neutron Activation Analysis (INAA) and Laser Ablation-Inductively Coupled Plasma-Mass Spectrometry (LA-ICP-MS) have shown potential for chert characterization in the greater southeastern United States. This presentation will review recent successes in geochemical analyses of Florida cherts while also discussing why XRF failed where INAA and LA-ICP-MS have shown promise. A detailed understanding of regional geology and geomorphology is critical to a successful provenance study. Additionally, local taphonomic processes can introduce an added set of geochemical variables that must be accounted for. By addressing chert provenance studies from the ground up, researchers can move toward more reliable ascription. A systematic and multimethod approach to geochemical characterization within a regional geological framework is recommended for future provenance studies in Florida.

[30]

Chair

Burkett, Kenneth (Carnegie Museum)

[60]

On the Rocks at Parkers Landing

In northwestern Pennsylvania, only a very few special places still exist where evidence of prehistoric activities can be found as part of the undisturbed natural landscape. The Parkers Landing Petroglyphs (36CL1) is one of the rarest and perhaps the most significant of these sites. For many generations native people visited this riverbank site on the Allegheny River to inscribe images of humans, fish, birds, animals, and their tracks as well as mythological figures and other abstract forms into the rocks. This paper will present an updated overview of this important site and discuss its seasonal use and relationship to other rock art sites within the Upper Ohio Valley.

Burks, Jarrod (Ohio Valley Archaeology, Inc.) and Albert Pecora (Ohio Valley Archaeology Inc.)

[188]

The Last Great Escape: Recovery of 1st Lt. Ewart Sconiers, an American WWII Bombardier Imprisoned at the Stalag Luft III POW Camp

Like many recoveries, locating 1st Lt Ewart Sconiers required research, persistence, and good old-fashioned luck. While imprisoned at the Stalag Luft III POW camp in German-occupied Poland, complications from an injury sent Sconiers to a hospital in a neighboring town—where he died. His burial occurred in a nearby municipal cemetery. During the Russian occupation of Poland, the aboveground cemetery features were “erased” and memories of the American POW’s grave faded. In 2013 Ohio Valley Archaeology Inc. (OVAI) volunteered its time and equipment to conduct a geophysical survey in the cemetery, now a park in Lubin, Poland. Results of the survey work, along with WWII-era aerial photography and graveside imagery, identified two areas of interest excavated by OVAI in 2015 in agreement with DPAA. Trench 1 at the edge of the cemetery uncovered the graves of infants. Trench 2 revealed fourteen burials within or scattered between seven graves. Bone distribution patterns and evidence of an intrusive trench excavation suggested an upper set of graves had been removed. Concurrent with our excavations, Sconiers’ headstone was discovered in a recently-posted online photograph from a French military cemetery in Gdansk, Poland. A positive identification was subsequently made by DPAA.

Burks, Jarrod [176] see Snider, Joseph

Burnell, Taylor (University of San Diego) and Mark Sutton (University of San Diego)

[258]

An Integrated Chemical and Palynological Approach to Identifying Prehistoric Adhesives in the Southwest and Great Basin

The use of various organic resins as mastics and sealants in prehistoric North America is well documented in the archaeological and ethnographic records. While the utilization of the creosote lac resin by people in western North America is known, resinous material discovered in an archaeological context is most often attributed as being from the genus *Pinus* without formal analysis, partly due to the difficulty and cost in the standard methods of identification. Here, three new techniques that can be used in conjunction for the identification of resinous materials that are simpler and more cost-effective than previous methods are offered and will hopefully allow for the further study and understanding of this ancient material science.

Burnett, Paul (SWCA Environmental Consultants) and Jonathan Libbon (SWCA Environmental Consultants)

[77]

Archaeological Spatial Patterning in Northern Ohio

Spatial patterning of archaeological resources is commonly discussed in regional summaries of prehistory; however, the basis for

these interpretations can be based upon a limited number of sites and researcher experience, which can result in interpretations that are not necessarily grounded in replicable studies. Taking a different approach, we researched a sample of nearly 13,000 archaeological resources from four physiographic regions in northern Ohio: Lake Plains, Till Plains, Glaciated Allegheny Plateau, and Unglaciated Allegheny Plateau. Looking at archaeological occurrences from the Paleoindian to Protohistoric time periods, we identify trends in archaeological site placement using statistical correlations between archaeological sites and environmental parameters. Archaeological resources tend to be strongly correlated with elevation, topographic roughness, distance to waterbodies, and distance to stream confluences. Other significant correlations were found between sites and height above surroundings, slope, aspect, and distance to streams. Building from these correlations, we produced a series of probability models and associated maps that depict the relative likelihood of site occurrence. The result is a comprehensive, replicable summary of trends in site location through time across northern Ohio.

Burningham, Quintessa (University of Idaho)

[204]

Northern Ute Adaptations to Forced Relocation: An Analysis of Commodities on the Uintah and Ouray Reservation (1880–1910)

The turn of the twentieth century was a period of transformation for the Utes in northeastern Utah. Forced to compete for their traditional resources with Euro-American settlers, and to do so within the restrictions of the reservation system imposed by the federal government, the Utes could no longer rely solely on those traditional resources to sustain themselves. Despite changes to material culture and attempts by the United States government to assimilate American Indian groups, the Utes retained their cultural values and practices by adapting them to fit their new environment and resources, including those brought by settlers. Using a combination of historical records and archaeological evidence, I am examining the incoming wave of material culture and how the Utes accepted, altered, and resisted these changes.

[204]

Chair

Burns, David (University of Texas, San Antonio)

[158]

Investigations of an Early Maya Ball court at Las Ruinas de Arenal, Belize

Las Ruinas de Arenal, located in the Mopan River valley of western Belize, is a medium sized ceremonial center. Arenal was first settled in the Middle Preclassic and was occupied through the Late to Terminal Classic. Recent research by the Mopan Valley Preclassic Project has investigated the ball court attached to the eastern side of the site's E Group complex. Investigations of the ball court in 2018 and 2019 have yielded data relating to architectural form, construction sequences, and ritual activity. The earliest version of the ball court dates to the Late Preclassic period, suggesting the importance of the ballgame within early Maya society in the Mopan valley.

Burns, Gregory (University of Utah)

[15]

Monetized Trade and Correlated Risk in Central California

Isotopic evidence suggests use of shell bead money in Central California developed during a time of high environmental uncertainty and decreasing social trust. Monetized exchange likely played a role in risk mitigation while maintaining independence of small groups. As a utility maximizing form of sharing, the role of trade in mitigating risk from variance that is uncorrelated in time and space is evident. This study explores the relationship between trade network function and parameters of correlation in resource variability. Observations of ethnographic exchange in California are consistent with the requirements of trade for overcoming correlated variability.

Burns, Samuel (Oregon State University), Sam Stone (Oregon State University) and Rafaella Lisboa (California State University, Northridge)

[195]

Overcoming Barriers: Pleistocene Migration and Archaeological Paradigms

Recent discoveries at Cooper's Ferry and Cedros Island have demonstrated that the initial migration into the Americas involved people with diverse subsistence strategies and multiple technological systems who occupied early, but substantial, Pacific Coast and Columbia Plateau settlements. Long-standing models for Pleistocene migration into the Americas focused on a single subsistence model (megafauna hunting), a single technological system (fluted point assemblages), and a single entry route (the Ice-Free Corridor). That the story of the initial migration is more complicated than this should not be surprising; the long-lasting entrenchment of such simplistic archaeological models should be. We argue that this entrenchment is largely attributable to the historical lack of diversity within the archaeological community. If we are going to tell the stories of our species, we need an archaeology that is open to diverse and traditionally marginalized voices. This requires a dedication to eliminating participation barriers in our field: academic cultures of abuse and impunity, imperialist attitudes toward systems of knowledge outside of the dominant Euro-American tradition, and high financial entry costs. Until archaeology embraces the diversity of human experience among its practitioners, it has little hope of telling the diverse stories of humanity.

Burr, Margaret (University of Oxford)

[110]

Moderator

[110]

Discussant

Burtenshaw, Julia (Los Angeles County Museum of Art)**[109]***"If We Understand Each Other, We Are Family": A Case Study for Collaboratively Curating Ancient Colombian Objects in the Los Angeles County Museum of Art (LACMA)*

This paper presents a case study from LACMA's Art of the Ancient Americas department (AoAA) about a major exhibition on the arts of ancient Colombia (Portable Universe/El Universo en tus Manos: Thought and Splendor of Indigenous Colombia. On view 2021–2022). Over the past 5 years the AoAA has been committed to developing better ethical practices for working with Precolumbian collections and has done so primarily by strengthening the relationships with source countries and indigenous communities. The curators of Portable Universe have spent the last 3 years collaborating with the Arhuacos of the Sierra Nevada de Santa Marta, respecting their insistence that their knowledge is not another curiosity for the exhibit, but that they are collaborators with an agenda and message. More than listening and learning from them, it has meant participating (practicing) what they want to teach. Although initially contentious, a true partnership has developed and the discussions have ended up being less about the objects held in LACMA's collection than about the relationship being built, and about reaching a mutual understanding of the world.

Burt, Amanda (Indiana University)**[22]***Taboo to Chew: Cultural Influences on Dog Feeding*

Dog feeding strategies employed by Indigenous North Americans have been shown to vary across place and time. Human restrictions on prey animal parts given to dogs have been recorded in the ethnohistoric record. Dog feeding taboos are transcultural and often speak to ideas of a dog's place among other animals and the influence dogs may have on the predator-prey relationship in future hunting events. Restrictions humans have placed on food sharing with their dogs range from mild apprehension to elaborate rituals, with the goal of keeping balance in the natural world; especially between the domestic and wild, the owned and unowned. This paper uses multiple lines of evidence including archaeological faunal remains, dental microwear, animal iconography, and ethnohistoric records to investigate food sharing and feeding restrictions between humans and their dogs. Rituals and habits performed by people can be interpreted through these lines of evidence and provide a more contextualized understanding of dog-keeping in the past.

Burt, Patrick "De?ileligi" [97] see Cowie, Sarah

Busby, Ashley [16] see Boyd, Carolyn

Bush, Dominic (East Carolina University), Jennifer McKinnon (East Carolina University), Erin Field (East Carolina University), Nathan Richards (East Carolina University) and Kyra Price (East Carolina University)**[221]***Microbially Influenced Corrosion of Underwater Cultural Heritage: Importance, Challenges, and Future Directions*

Aircraft were a major component of the U.S. war effort in the Pacific Theatre of WWII, and today numerous examples can be found throughout the waters of the Asia-Pacific region. Due to their cultural and historical significance to modern stakeholders, understanding the decay trajectories has become an important concern for maritime archaeologists. While the majority of corrosion studies have focused on electrochemical exchanges at the seawater-metal interface, less attention has been paid to the effects of colonizing microorganisms (e.g., sulfate-reducing bacteria) that contribute to increased rates of corrosion. This paper attempts to address this issue by summarizing the literature on microbially-influenced corrosion (MIC) of submerged cultural heritage before describing an ongoing project in Saipan. The latter focuses on several aircraft wrecks associated with the Battle of Saipan (1944) and is believed to be the first study to explicitly deal with MIC of archaeological aluminum. Beyond describing recent fieldwork, methodology, implications of results, and future avenues of research will also be discussed. Special attention will be paid to the challenges of conducting this type of research in remote island locales in hopes of developing a set of operating procedures to be used in monitoring MIC of underwater cultural heritage.

Butler, Joel [198] see Griffith, Timothy

Butler, Michelle (Universidad de las Américas Puebla) and Geoffrey McCafferty (University of Calgary)**[133]***Zapotec Diaspora in Epiclassic Central Mexico*

Epiclassic central Mexico has long been an enigma, but recent work is bringing it into focus. As other regions are explored, they are being integrated into a more complete and complex cultural mosaic. With the recent dating coming out of Monte Albán suggesting that the Zapotec center remained influential in the Epiclassic, it is hypothesized that Zapotecs may have expanded into central Mexico to fill the void left after the decline of Teotihuacan. In this presentation, we look at the cultural dynamics of Zapotec relations in the central valleys. Specifically, we consider the case of Los Teteles, a site in the central Puebla valley that exhibited strong Zapotec characteristics in its architecture, burials, and material culture. The site was excavated in the 1970s and reporting consisted of one master's thesis that was never published. We reanalyze this data in light of recent work in central Mexico.

Butler, RaeLynn (Historic and Cultural Preservation Manager)**[113]***Moderator*

Butler, Virginia [129] see Bovy, Kristine

Butrón Cruz, Miguel Ángel (Proyecto Arqueológico Origen y Desarrollo del Paisaje Urbano de Tamtoc, S.L.P.) and Norma Valentín Maldonado
[144]

La casa del linaje del Armadillo

A partir del análisis espacio-temporal del Grupo F de Tamtoc, de los contextos arqueológicos particulares de F7 y de los estudios bioantropológicos de los individuos ahí inhumados, se discutirá el carácter de edificio y, si es posible, plantear que fue la residencia de uno de los linajes gobernantes de Tamtoc cuyo animal totémico era el Armadillo.

Butrón Cruz, Miguel Ángel [144] see Valentín Maldonado, Norma

Buvit, Ian (Pacific Slope Archaeological Laboratory)
[140]

How Landscape Changes on Hokkaido Led Modern Humans into the Americas

From the perspective of coastal migration from the start, I contend late-glacial Pacific Rim landscape changes, especially in northern Japan, led modern humans into the Americas. I describe events since the beginning of the global Last Glacial Maximum (LGM) starting ~30 ka that coincided with key benchmarks in the prehistory of Hokkaido and the peopling of the New World. To start things off, delayed onset of LGM conditions pulled ancient southern Siberians into a coastal refugium on Hokkaido 30–26 ka, then part of a peninsula comprising Russian and Japanese islands. By 24 ka when the LGM finally arrived on the peninsula, Paleo Siberians made their way back into northeast Asia carrying wedge-shaped microblade cores. Interstadial conditions reached PSHK by 19 ka and human populations spiked, but by 17 ka things worsened and another exodus occurred. This time it was ancestral Native Americans migrating into and throughout the Western Hemisphere.

Buxeda i Garrigós, Jaume (ARQUB, GRACPE, Universitat de Barcelona) and Marisol Madrid i Fernández (ARQUB, GRACPE, Universitat de Barcelona)

[196]

The Impact of European Ceramic Technology in the Colonial New World: Relations and Influences during the Atlantic Expansion

The Tecnolonial project conducts a large scale investigation into the movement of ceramics from Europe during the colonization of the Atlantic and Americas. It concentrates on the effects of imported pottery and craftspeople on indigenous ceramic technologies and the nature of colonial ceramic production. To achieve this aim it has carried out an extensive characterization program of ceramics produced during the sixteenth-seventeenth centuries in the Iberian Peninsula, establishing reference groups for key types of pottery exported in the colonial expansion. Their origins and production technology allows an assessment of their impact on indigenous ceramics and on the newly produced colonial ceramics. Our integrated analytical approach (XRF, XRD, SEM-EDX, optical microscopy) has characterised European glazed and unglazed coarse wares, cooking wares, majolica, transport jars, and sugar cones, along with the different indigenous pottery traditions and colonial products manufactured overseas. Sites researched are located in the Canary Islands and the Americas, from Argentina and Chile to Canada. It is contended that considering ceramic technological change on such a large geographical scale has distinct advantages, revealing important patterns which shed light not only on the complexities of pottery production, but also on significant social changes which affect both colonists and indigenous societies.

Buxeda i Garrigós, Jaume [196] see Thompson, Helen

Cabadas, Horacio (Arizona State University), Kelsi Stroebel (Arizona State University), Claudine Gravel-Miguel (Arizona State University) and Jayde Hirniak (Arizona State University)
[38]

Testing the Adaptability of Photography Methods in Various Archaeological Contexts

Preservation of archaeological sites is an important but difficult task to accomplish. To help with such preservation, the team working at Pinnacle Point (PP5–6) located in Mossel Bay, South Africa, developed a method to create high resolution, color-corrected, and georectified photomosaics of excavated stratigraphic sections. The stratigraphic sections are photographed using a digital camera and flashes in controlled settings. This methodology makes it possible to study the stratigraphy of archaeological sites remotely or analyze plotted finds in reference to their precise location. The original PP5–6 platform design was perfectly adapted to the challenges of PP5–6 stratigraphy but was not suitable for the archaeological sites that formed the HOMER consortium. To adapt to these sites' layouts, we developed a new device to use during the 2019 excavation season at Knysna Head 1 (KH1), a site located in Knysna, South Africa, and Hora 1 in Malawi. The device worked well at KH1, a rock shelter, but faced difficulties at Hora 1. In this poster, we present these differences and discuss their impacts on image processing, and ultimately on the final georeferenced mosaic. We will then discuss possible changes for future equipment that would make such a method applicable to other sites.

Cabana, Graciela [169] see Fleskes, Raquel

Cabanes, Dan (Laboratory for MicroArchaeology, Rutgers University), Diego Angelucci (Universita di Trento), Valentín Villaverde (Universidad de Valencia), Josefina Zapata (Universidad de Murcia) and João Zilhão (ICREA, Universitat de Barcelona)

[162]

A Microarchaeological Approach to the Use of Fire during the Middle and Upper Paleolithic at El Abrigo de la Boja, Spain

El Abrigo de la Boja offers a unique opportunity to study the evolution of fire use during the Middle and Upper Paleolithic. The site is a small rock-shelter located in the Rambla Perea valley, along a natural communication corridor between the coastal lowlands and the interior plateau in Murcia, SE Spain. The excavation yielded a 5-meter archaeological sequence showing a basal Middle Paleolithic occupation below a long Upper Paleolithic sequence. Although bone is rarely recovered, the lithic assemblages are well-preserved. The preservation of the fire remains, including ashes, charcoals, and thermally altered sediments is pristine and rarely seen elsewhere. Here we studied the fire remains using microarchaeological techniques, namely phytolith analysis and mineral identification through FTIR, to evaluate the anthropogenic impact on the site. The use of fire reached its maximum intensity during the LGM, but the results also show significant differences between Middle Paleolithic and Upper Paleolithic occupations. The current data points to changes in the occupation pattern of the site that can be linked to climatic stress and differences in the adaptation strategies.

[162]

Chair

Cable, Charlotte (Michigan State University), Lloyd Weeks (University of New England), Kristina Franke (University of New England) and James Roberts (University of New England)

[59]

Thriving in the Desert: Reconceiving "Marginal" Environments in Desert Arabia through the Persistent Place of Saruq al-Hadid (Dubai, UAE)

Archaeological sites in marginal environments can act as sensitive "barometers" for the effects of environmental change on past communities (and vice versa). Receiving an average of less than 35mm of precipitation per year, the hyper-arid Rub' al-Khali Desert of Arabia has typically been understood from just such a perspective—exploited during periods of significant climatic amelioration such as the early to mid-Holocene Humid Phase, and depopulated during periods of climatic deterioration in so-called 'tabula rasa' events. However, recent research on the eastern margins of this so-called Empty Quarter provides a more complex and nuanced picture of ancient exploitation of the desert zone. Evidence from the site of Saruq al-Hadid (Dubai, UAE) demonstrates significant, repeated, and highly varied occupation and exploitation of the desert environment over the course of more than five millennia, from the late fourth millennium BC to the pre-modern period. In this presentation, stratified archaeological, archaeobotanical, zooarchaeological, and archaeometallurgical evidence from Saruq al-Hadid is used to document the fluctuating scale and nature of human activities at the site, and its changing environmental context over the mid- to late Holocene, a period during which varied short-term climate fluctuations can be traced against a regional background of increasing aridification.

Cable, Charlotte [185] see Quates, E. W. Duane

Cadena, Pete [77] see Snitker, Grant

Cagney, Erin, Kimberly Blanke (Veterans Curation Program) and Nancy McKenzie (Veterans Curation Program)

[187]

Empowerment through Employment: How Archaeology Is Helping Women Veterans Break Barriers

Since 2009, the Veterans Curation Program (VCP) has employed over 600 veterans of the United States armed forces as archaeology lab technicians to assist in rehabilitating at-risk archaeological collections belonging to the U.S. Army Corps of Engineers. While in the program, veteran technicians receive vocational and technology training that helps them gain access to the mainstream job market. Many veterans face barriers to gainful employment for various reasons, ranging from the lack of a 4-year college degree to needing a stronger community support system. Often, women veterans experience more barriers to employment than men, owing to a variety of factors frequently linked to gender-based discrimination. The VCP supports these women by offering stable employment, vocational training, career coaching, access to resources, and a supportive community environment. This poster seeks to recognize and celebrate the women graduates of the VCP and demonstrate how archaeological work is helping the women's veteran community to overcome barriers and gain success in their personal and professional lives.

Cagney, Erin [187] see Bradley, Kevin

Cajigas, Rachel (University of Arizona)

[140]

Long-Term Effects of Human Modifications to Floodplain Soils at the La Playa Site

Early agriculturalists in the southwest United States/northwest Mexico region modified the floodplains of the Basin and Range province to create productive agricultural fields despite arid conditions during the Early Agricultural period (2100 BC–AD 200). Magnetic gradiometry surveys at the La Playa archaeological site (SON:F:10:3) in Sonora, Mexico, identified approximately 8,700 m² of intact agricultural fields buried beneath the floodplain alluvium. A network of earthen irrigation canals brought water from the Boquillas River to agricultural fields that were up to 1 km away. These soils were excavated, described, and sampled for phytolith, textural, and micromorphology analyses. Results from these geoarchaeological analyses indicate that field soils were fine-textured, organic-rich sediments that were saturated with water. These micromorphology and textural samples were also compared to samples from canals and other areas on the floodplain that were not cultivated in order to understand how humans modified the floodplain sediments to create productive agricultural soils. Phytolith data complements this information to assess changes in plant

communities at La Playa over time. The documentation of these anthropogenically modified floodplain soils that are at risk of severe modern erosion is important in the study of long-term agricultural practices in arid lands.

Calabrese, Agata (University of Sydney)

[25]

Lamenting the Dead: The Acoustic Element in Bronze Age Funerary Rituals in Syro-Mesopotamia

This paper will employ GIS in exploring the experiential aspects of the burial process in Early Bronze Age North Mesopotamia, with a particular attention to funerary soundscapes. To investigate the potential impact of vocal and musical sound, a 10m resolution Digital Elevation Model (DEM) was developed, and the "System for the Prediction of Acoustic Detectability" (SPreAD-GIS) was employed to predict the potential acoustic 'footprint' on a series of Early Bronze Age (third millennium BCE) archaeological sites. The results of this study suggest that music and vocalization (i.e., lamentation-singing) had strong impacts, both within the immediate mortuary landscape and beyond. This has important mnemonic consequences for the society of the first urban centers. The funerary arena in Early Bronze Age Syro-Mesopotamian society involved many different sensory experiences, among the most important visibility, movement/processions, and sound. The archaeological sites of Ebla, Mari and Ugarit preserve the archaeological/cuneiform evidence for a rich music culture associated with funerary rituals, but how this impacted on the society remains unclear. A better understanding of the acoustic landscape will form a vital component in assessing the societal impact of public and private funerary rituals in the first urban centers.

Caldarelli, Solange [161] see Kipnis, Renato

Cali, Denise (University of South Florida), Kaitlyn Kingsland (University of South Florida), Davide Tanasi (University of South Florida), Laura Harrison (University of South Florida) and Stephan Hassam (University of South Florida)

[104]

The Benefits of 3D Digital Imaging for the Study of Roman Villas in Sicily: The Villa of Caddeddi on the Tellaro River (Noto, Italy)

The Roman Villa of Caddeddi on the Tellaro River at Noto (Sicily), discovered and explored between late 1970s and early 1980s, is one of the largest in south-eastern Sicily. With an extension of about 6,000 m², the complex is organized around a central peristyle surrounded by a colonnade, the Villa of Caddeddi has been traditionally dated on the basis of numismatic evidence to the half of the fourth CE. Three rooms around the peristyle itself are paved with outstanding mosaic floors in African style. The excavations of the Villa were never published and the only research generated in the last five decades was just on the style of the mosaics. In early summer 2019, an interdisciplinary research project aimed at reassessing the complex and focusing of eventual phases of reuse in the Late antiquity was undertaken via a combined on-site analysis of all the built stratigraphic units and architectural elements and the overall 3D digitization via terrestrial laser-scanning and digital photogrammetry. The analysis of the data gathered on-site, supported by new technical drawings extracted by the 3D data clearly shows the presence of multiple later phased of use and shed light on its peculiar spatial organization.

Calla Maldonado, Sergio [4] see Capriles, José

Callaghan, Michael (University of Central Florida) and Brigitte Kovacevich (University of Central Florida)

[54]

The Ancient Maya Economy: Dual? Integrated? Embedded? Or All of the Above?

In this paper we argue that the complexity of Maya economic structures and the debates that ensue over their interpretation stem from the fact that manifestations of those economic structures vary so greatly across time and space in the precolumbian Maya world. Maya economies were both dichotomized along elite and commoner lines, while also integrated in some times and places. For this reason, a priori assumptions and traditional economic models must be used with caution to characterize the entirety of the Maya economy. The embedded nature of Maya economies further complicates interpretation as many traditional economic models do not take into consideration the implications of the interconnectedness of social, political, and economic structures and primarily focus on evidence of wealth accrual and power consolidation among the elite.

Callaghan, Michael [39] see Crawford, Dawn

Callaghan, Michael [5] see Whyte, Rachel

Calongos Curotto, Manuel

[105]

Between Incas and Lunahuanás: The Late Prehispanic Occupation in Lunahuaná, Peru

The historical accounts of the Cañete valley, recovered by the Spaniards, tell us that the Incas found two different kinds of reactions to their conquest attempts: while the Guarco, in the lower valley, resisted the Incas domination; the Lunahuaná, in the middle valley, supported the Inca troops and generals. This contradiction in these different lines of evidence suggests a relative autonomy between the groups living in the middle and lower valley of Cañete. Even though the idea of two different ethnic groups living in the lower and middle valley has been rejected by recent archaeological studies, there is still little evidence about how people in the middle valley organized before the arrival of the Incas and how does it change during the Inca regime. The data collected in a survey of the Lunahuaná district in the middle Cañete valley have revealed interesting patterns regarding public and funerary architecture. The use of GIS analysis has provided a preliminary understanding of the territorial organization in this area. This analysis shows the presence of a recurring type of public architecture, that in many cases adopts Inca traditions. Besides it also shows the presence of different funerary traditions present in the same sites.

Camacho, Frank [100] see Vilar, Miguel

Cambranes, Rafael [206] see Garrison, Thomas

Cameron, Asa (Yale University), Bukhchuluun Dashzeveg (Yale University) and Jonathan Mark Kenoyer (University of Wisconsin, Madison)

[62]

Making the Exotic from the Familiar: The Source and Production of Carnelian Beads during the Late Bronze Age and Early Iron Age in Mongolia

During the Late Bronze Age and Early Iron Age in Mongolia, communities across the region adopted mobile pastoralism and horse-riding technology. In conjunction with these changes in subsistence and mobility patterns, innovative funerary practices emerged that incorporated monumental construction and new mortuary offerings. Included in these grave goods were forms of body adornment that utilized carnelian beads. Since the first discoveries of these semi-precious stone beads, archaeologists have speculated about the origin of the carnelian and assumed that these artifacts were exotic trade goods linking Mongolia to regions as far as the Indus Valley in Southeast Asia. This project presents the results of LA-ICP-MS (Laser Ablation Inductively Coupled Plasma Mass Spectrometry) and SEM (Scanning Electron Microscopy) analysis of carnelian beads from the Late Bronze Age and Early Iron Age. These analyses provide the first data on the source of carnelian beads and their related production technology. The results inform our understanding of craft production and exchange patterns during this period in Mongolian archaeology.

Cameron, Catherine (University of Colorado)

[131]

Hidden People in the Past: Honoring the Scholarship of Debra Martin

Because archaeologists use ancient material culture to reconstruct the lives of people in the past, they tend to find those people with the most abundant and well-preserved property. Only the past few generations of archaeologists have looked beyond large settlements and monumental buildings to investigate common people. But just like today's societies, those in the past were made up of the rich and poor, prominent and insignificant, and the truly marginal. Fifteen years ago I began to study one of the most marginal of ancient people: captives taken in raiding and warfare. Using ethnographic and ethnohistoric records I discovered a class of people largely unstudied by archaeologists. But how to find these people in the past? I realized that Dr. Debra Martin had, using bioarchaeological methods, developed robust analytic tools to "see" captives and other marginalized groups in the archaeological record. This paper explores recent developments in the study of captives and focuses especially on how the scholarship of Debra Martin and her students has formed a critical grounding to this work.

Campagnolo, Leticia [196] see Thompson, Helen

Campbell, Rod (Institute for the Study of the Ancient World, NYU)

[210]

Violence and Complexity

What is the relationship between violence and socio-political complexity? Political theorists since the Enlightenment have debated the relationship between violence and social order. More recently, classic neo-evolutionary theory posited an intensification of violence attending state formation and the growth of inequality, while Keeley, in *War before Civilization*, argued that intercommunity conflict is present in human societies of all scales, and Claessens showed how war could serve to defend against the growth of hierarchy. If egalitarianism does not necessarily mean pacifist, and complex polities, down to modern nation states, can have lesser or greater degrees of violence, conflict and inequality, then what are the variables? This paper will attempt to sketch the outlines of a theory of violence and social complexity, exploring the relationships between factors such as hierarchy, scale, and mode of production with moral economy, ontology, and cultural models of aggression, conflict, and competition. A broad concept of violence including physical-instrumental, structural, and symbolic violence will be employed to explore historical transformations in the nature of violence and its relationship to socio-political order.

Campbell, Sarah [129] see Bovy, Kristine

Campbell, Stuart [120] see Pal Chowdhury, Manasij

Campbell, Wade (Harvard), Davina Two Bears (SAR) and Timothy Wilcox (Stanford University; Crow Canyon Arch. Center)

[41]

A Diné Analysis of the Praxis of Indigenous Archaeology and the Reclamation of Tribal Histories

Archaeology offers a unique methodological lens toward the study of past peoples and events. Yet despite the incredible potential of archaeology as a tool for discussions of indigenous identity and tribal history, many indigenous communities have historically distrusted the field. In the United States, archaeology's connection to the late nineteenth-century colonial expansion made the rich collection of historical and cultural knowledge it produced the domain of non-native specialists, not the source communities. Over the past thirty years, however, archaeological research prioritizing the interests, viewpoints, and active participation of Native individuals themselves has become more frequent. The "indigenous archaeology" movement has enabled Native researchers to challenge long-standing misconceptions about Native histories and help preserve aspects of traditional culture at risk. Perhaps most

importantly, indigenous archaeology has continued to evolve as the current generation of Native researchers draw upon a diverse array of methodological and theoretical influences in their work. Using a series of recent Navajo (Diné) archaeological research projects as case studies, this paper reflects upon this innovative trend and highlights a series of themes increasingly common to indigenous archaeological research in the twenty-first century.

Campetti, Casey (AECOM)

[114]

Discussant

Campiani, Arianna (Universidad Nacional Autónoma de México) and Esteban Miron Marvan (University of California, Berkeley)

[197]

The Functional Variability of Pottery as a Way to Evaluate Architectural Compounds' Typology within a Classic Maya City: The Case of Chinikihá, Chiapas

A program of intensive excavation has been carried out throughout the Classic Maya site of Chinikihá, obtaining an extensive corpus of heterogeneous materials and data that can be analyzed beyond the chronology. In fact, the ceramic analysis can represent another source of information if considered according to its intended use. The categorization of containers depending on their function, their presence and frequency can provide interesting insights into the social status of a compound's inhabitants, can point to specific practices- or their intensity- carried out within a compound and their variability during the Ajín ceramic complex (700–850 CE). In this presentation, we would like to present the result of the analysis that contrasts functional ceramic categorization with the architectural compounds' variability, where also location, frequency, labor investment and closeness to the civic-ceremonial core are considered. Cross-referencing the ceramic functional variability with the proposed architectural typology- also applied at Palenque- can indicate if the formal arrangement of the compounds responds to the activities suggested by artifacts and ceramic containers' variability.

Campos, Cinthia [147] see Hertfelder, Paula

Campos, Cinthia [79] see McGuire, Randall

Cancho Ruiz, Christian (Pontificia Universidad Católica del Perú) and Alicia Gorman (University of California, Santa Barbara)

[21]

Nuevas evidencias desde Cerro Tortolita un sitio del Intermedio Temprano en la costa sur del Perú-Ica

Nuestra investigación busca entender la relación entre la religión y la política en contextos domésticos durante la época Nasca. Es así que Cerro Tortolita (valle de alto de Ica), dada su naturaleza y escala constructiva; el cual incluye un componente ceremonial y otro residencial; constituye un sitio de singular importancia para el evaluar cómo operan ciertos mecanismos religiosos y de autoridad en una sección del valle poco explorada. Investigaciones previas en la "Zona Ceremonial" han permitido identificar ciertos elementos análogos al centro ceremonial Cahuachi, incluyendo el acceso a su cerámica distintiva (Vaughn 2017). Nuestro proyecto por su parte fue diseñado para complementar la información y establecer correlaciones entre ambas áreas. Es así que, se excavó las viviendas ubicadas en la denominada "Zona Residencial Primaria" (al sur de la Zona Ceremonial), un área que contiene aglutinadas más de 100 estructuras de piedra de forma semiovalada; teniendo por objetivo evaluar el grado y la naturaleza de diferenciación social en el sitio, específicamente los "enredos" entre autoridad religiosa y potenciales desigualdades económicas y políticas.

Cancho Ruiz, Christian [21] see Gorman, Alicia

Canilao, Michael [188] see Monaghan, John

Cannarozzi, Nicole (University of Florida)

[273]

The Zooarchaeology of the Christiansted National Historic Site St. Croix, USVI

The Christiansted National Historic Site, located in the town of Christiansted on St Croix, U.S. Virgin Islands, was a Danish military compound that served as a major trading hub dealing in the trade of enslaved Africans. As such, the compound was home to both Danish soldiers and the enslaved Africans on whom they depended for survival. This research presents preliminary data from the analysis of faunal remains excavated from areas within the compound targeted to locate the living quarters and activity areas associated with enslaved Africans to learn more about slave life in this unique context. Preliminarily, this study indicates a heavy reliance on young, domesticated animals. The representation of all skeletal portions of each of the domestic animals rather than just the meaty portions of the fore and hindquarters, suggest livestock may have been raised within the compound. Marine resources such as fishes and shellfish are present in fewer frequencies than expected given the proximity to the coast and compared to other Danish colonial islands. The presence of nonlocal faunas and imported or translocated animals like hutia, fallow deer, domestic rabbit, cat, and cod are rare, but may indicate a greater degree of inter-island connectivity than previously thought.

Cannavò, Valentina [196] see Levi, Sara

Cannon, Joshua [254] see Bradley, Benjamin

Cannon, Molly, Benjamin Johnson (Utah State University), Robert Godard (Utah State University) and Barbara Winter (Simon Fraser University)

[203]

Value Added by the Use of Comparative Analyses for the Lost and Found in Museum Collections

Establishing context for museum artifacts without provenance is challenging, however it is possible to continue research on these artifacts by comparative analysis. Our research compares two similar Peruvian textiles from different museums; Utah State University and Simon Fraser University. The USU textile contains very little associated contextual information. Utilizing color assessment, portable x-ray fluorescence, thread counts, and microscopic analysis, we were able to establish evidence to place these artifacts in a shared time and space. Our results provide clues about textile construction and production and demonstrate similarities between the two pieces. However, we found that the visual comparative analysis allowed us to determine correspondences but did not determine authenticity of the USU textile. We additionally employed AMS dating to determine if the USU museum piece is temporally contemporaneous with Chancay culture, resulting in a date of 670 +/- 20 radiocarbon years, which would give us a calibrated date range of 1300–1394calAD. These dates indicate that the USU textile was constructed during the Late Intermediate period of Peru. In this presentation, we present these methods, findings, and discuss implications for establish community processes for textile production in the Late Intermediate period.

Canouts, Veletta (Canouts Consultancy LLC)

[168]

The Smithsonian's Hopi Ceramic Project: A Perspective

Ron Bishop has made significant contributions to the study of ceramic production and exchange using Neutron Activation Analysis. His research spans both the Old and New Worlds though his emphasis has always been on ceramics from Mesoamerican and Central America. One of his greatest strengths has been mentoring "predoc" and "postdoc" students just starting to build their own research expertise. The start of the Smithsonian's Hopi Ceramic Project grew out of his collaboration with a well-known Hopi ceramicist. During the course of this project, he and his colleagues had the opportunity to mentor a younger generation of Hopi youth about their own ceramic tradition. That opportunity remains one of the highlights of the project, and Hopi youth have continued to experience similar support through programs developed by Northern Arizona University's Department of Anthropology.

Canterbury, Jacob (Texas A&M University) and Rissa Trachman (Elon University)

[233]

Not by Maize Alone: A Meta-Analysis of Ancient Maya Diets Using a Stable Isotope Mixing Model

Stable carbon and nitrogen isotope analysis has a long history in the study of Ancient Maya diets to assess variability in consumption of maize, animal protein, etc. Recently, however, there has been increased understanding that stable isotope ratios are only qualitative proxies for individual consumption, and therefore any comparative analysis using such proxies are by definition limited in nature (e.g., more/less meat; more/less maize). Bayesian stable isotope mixing models offer a method of translating stable isotope ratios into quantitative estimations of the proportions of foods consumed by integrating stable isotope data with actual nutritional information, such as food-source macronutrient composition, digestibility, and diet-to-tissue routing. This study uses stable isotope data from a number of Ancient Maya sites, contexts, and time periods in conjunction with a stable isotope mixing model (FRUITS) to examine the degree of temporal, regional and social variability in Ancient Maya consumption of four important food sources (C_3 plants, C_4 plants, terrestrial protein, and marine protein). It is our hope that such methods will revitalize interest in stable isotopic investigations of Ancient Maya diets, and add greater nuance to our understanding beyond restating that the Maya did, in fact, eat a lot of maize.

Canterbury, Jacob [53] see Trachman, Rissa

Canuto, Marcello (M.A.R.I./Tulane University) and Luke Auld-Thomas (Tulane University)

[102]

Lidar as a Tool to Estimate Late Classic Population in the Central Maya Lowlands

In 2016, the Pacunam Lidar Initiative surveyed over 2,100 km² of the Maya Biosphere Reserve in the Department of Petén, Guatemala. This lidar survey provided an unprecedented scale of settlement data that attest to elevated population levels throughout the southern Maya lowlands, especially for the Late Classic period. Current estimates suggest a population of between 7 and 11 million people for the region during this period. In this paper, we review various methodologies used to develop population estimates along with the potential problems inherent with each, proposing means of constraining these problems to produce reliable estimates. We conclude by discussing how ongoing fieldwork in these lidar survey regions is providing data that refine our estimates, rendering them more robust.

Canuto, Marcello (M.A.R.I./Tulane University)

[209]

Discussant

Canuto, Marcello [130] see Ponce, Jocelyne

Canuto, Marcello [223] see Stuart, David

Cap, Bernadette (University of Texas, San Antonio) and Rachel Horowitz (Appalachian State University)**[54]***Embedded Ancient Maya Economies*

Ancient economies are intertwined with aspects of the daily life of individuals in both market and premarket economies. To more fully understand these relationships, we must explore the ways in which economic actions are embedded and entangled within social, political, and religious practices. We briefly discuss the history of the term and how we utilize it despite a history of much debate within the sphere of economic anthropology. Discussion on the organization of ancient Maya economies has been a subject of much debate in part due to this history. With more recent finds of market exchange and more complex studies of economies it is a good time to reassess the ways in which economies are embedded throughout Maya society. We provide an example of this through a brief discussion of the exchange of bifaces among the Classic period Maya in western Belize.

[54]*Chair***Cap, Bernadette (University of Texas-San Antonio)****[155]***Discussant*

Cap, Bernadette [178] see Friedel, Rebecca

Cap, Bernadette [185] see Yaeger, Jason

Capriata, Camila [224] see Marcone, Giancarlo

Capriles, José (Pennsylvania State University), Sergio Calla Maldonado (Universidad Mayor de San Andrés), Hortensia Nina Vargas (Universidad Mayor de San Andrés) and Alejandra Aramayo (Universidad Mayor de San Andrés)**[4]***Reconstructing the late Holocene Prehistory of the Bolivian Chiquitano Forest*

The Chiquitano forest in the Bolivian Eastern tropical lowlands has recently been in the spotlight due to large-scale human induced fires. In this paper, we provide an overview of human settlement in the region and focus on recent research carried out at the site of Quimome, Santa Cruz, Bolivia. Our results suggest that communities were mostly low-level food producers that supplemented horticulture with hunting and gathering. All in all, archaeological evidence suggests human occupation in the Chiquitano forest region can be traced to at least the late Holocene and it featured sedentary communities distinct from contemporary societies in the Llanos de Moxos but were part of social interaction networks that reached as far as the eastern Andes.

[4]*Chair*

Capriles, José [59] see Bruno, Maria C.

Capriles, José [26] see Freeman, Jacob

Caramanica, Ari**[125]***The Pampa de Mocan: Dynamic Desert, Ancient Farmland*

Modern-day approaches to water management and distribution along the extremely arid north coast of Peru assume the natural environment is largely static. Farming in the region has been dependent on irrigation since prehispanic times. Yet, despite limited water availability, agro-industry continues to expand, due in part to ongoing support from the Peruvian State in the form of a large-scale inter-valley irrigation project. However, a recent El Niño event demonstrated that this landscape is geomorphologically, hydrologically, and biologically dynamic. Archaeological survey and excavation in the ancient farmland known as the Pampa de Mocan reveal that prehispanic landscape management strategies and irrigation technology accounted for and adapted to this dynamism. This paper presents these data and proposes a conceptual shift in the consideration of natural resource management and disaster response in the region today: from one that views the environment as marginal and static, to one that recasts the environment in longer timescales, bringing its dynamism into full relief.

Carbajal Salazar, Barbara [242] see Corcoran-Tadd, Noa

Carballo, David (Boston University), Daniela Hernández Sariñana (Boston University), Maria Codlin (Boston University), Alfredo Saucedo (Universidad Veracruzana) and Pablo Correa (Dartmouth College)**[150]***Public Spaces and the Neighborhood Center of Teotihuacan's Tlajinga District.*

The urban populace of Teotihuacan was organized into clusters of neighborhoods that featured public spaces with civic buildings, temples, plazas, and the residences of intermediate elites. Two of these neighborhood centers adjacent to urban epicenter are well documented by investigations at La Ventilla and Teopancazco. Recent investigations in the Tlajinga district provide a third example, but one that is located on the southern periphery of the city, 2 km from its center. They reveal that, in contrast to three previously excavated apartment compounds, the structures of the southern district center were elaborately made, featuring the construction techniques and mural painting characteristic of the urban epicenter. Excavations at two large platform structures and associated cultural deposits demonstrate status variability within Tlajinga and the fact that even Teotihuacan's peripheral communities were characterized by elaborate social infrastructure and ample access to non-local resources. Open plazas interspersed within the

district were likely multipurpose, serving for economic, ritual, and other community functions.

Carballo, David [242] see Schofield, Abigail

Carballo, Priscila (University of Texas, Austin) and Denise Axume (Austin Community College)

[176]

Comparison of Dental Pathologies between Males and Females from Two Archaic Texas Mortuary Sites

Dental pathologies may be used as indicators for dietary trends, dental health, nutritional stresses, behavior, and even social status of past populations. However, very few studies looking at dental pathologies have been conducted on populations from Archaic Texas mortuary sites, despite the large skeletal assemblages recovered in the twentieth century. This study attempts to expand upon previous research conducted on the Archaic Western Gulf Coastal Plains of Texas, specifically focusing on the contemporaneous mortuary sites of Ernest Witte and Morhiss. The skeletal remains of these two sites were examined for the presence of linear enamel hypoplasia (LEH), abscesses, and caries. The total number of adult individuals sampled include 235 individuals (52 estimated to be male and 49 female) from the Ernest Witte site and 179 (18 estimated to be male and 19 female) from the Morhiss site. Non-adult remains were excluded. The purpose of this project is to investigate differences in LEH, abscess, and caries presence and severity between males and females living during the Texas Archaic from these two mortuary groups. Results indicate there is no difference in presence of pathologies between males versus females suggesting the sexes exploited natural resources equally.

Carballo Marina, Flavia [67] see Belardi, Juan

Carbaugh, Aimée

[160]

A Work in Progress: Building Collaborative Relationships among Archaeologists, Indigenous Communities, and the General Public

The personal experiences of archaeologists and bioarchaeologists working with ancestral remains and on NAGPRA are rarely discussed, despite the increasing presence of collaborative practices in these disciplines. This shift toward a more inclusive archaeology encourages scholars to move beyond the legal requirements of consultation, to decenter academia, and to engage with stakeholders as equal partners in the research process. Depending on the university, conference, or publication these conversations may be more or less visible, often leaving students and scholars to seek out resources and support networks if they choose to undertake community-based methodologies. With little guidance regarding collaborative practices, it can be daunting, especially for young scholars, to figure out what collaboration looks like. This is particularly true for those of us who work in removal states where the relationship between descendant communities and archaeologists are not strongly formed. This paper considers the rewards and challenges of adopting a collaborative approach to the research process. I will discuss my initial steps toward building relationships with Indigenous descendant communities, non-Indigenous local residents, and with the faculty and students in my own department, and how this approach, ultimately, enriches archaeological interpretations and helps our field reach a broader audience.

Carbone, Catherine (Fort Huachuca Cultural Resources)

[214]

The Forgotten Mine: New Synthesis of the Manila Mine Site, Fort Huachuca, Arizona

Although mining is significant to the development of the state of Arizona, little is known about Fort Huachuca's only mine site. The mine was owned and operated by Alice McFadin between 1926 and 1928, when land and legal disputes forced its closure and the consolidation of McFadin's mining enterprise to the Huachuca Mountains along Fort Huachuca's southern border. The limited assemblage of mining-related artifacts and lack of available historical records led to challenges in documenting the regional impact of Manila Mine during the original recording of Manila Mine in the early 1990s. Access to digitized and public archival records, utilization of social media avenues to connect with descendants, and extensive site revisits in 2016 and 2019 resulted in an augmented synthesis of the Manila Mine site. New historical and biographical information is known about local miners, the role of women in southeast Arizona's mining industry and mining practices in the Fort Huachuca area.

Card, Anne-Marie (University of Wyoming)

[77]

That's WY: Do Archaeological Site Locations Identify the Best Places to Live in Wyoming?

Landscape archaeology and predictive models seek to understand the larger patterns of site locations, and there are ever-increasing amounts of archaeological, environmental, and topographic datasets available. While some smaller-scale studies of site location examined resource availability, I'll compare the Wyoming site location data to topographic and environmental information, such as elevation and slope, watershed data, and new wildlife migration corridor data. I will be looking at about 6,000 archaeological sites in Wyoming, separated into single and multi-component sites. Since multi-component sites appear to be "landscape magnets" I use them to try to determine which variables drive people to return to a certain place and identify why magnet locations were chosen. Finally, correlating these sites with radiocarbon dates will show whether resource preferences or site location within the state changed over time. Overall, I hope this research can add to the discussion and understanding of human-environment interactions in the past.

Carden, Megan [271] see Pestle, William

Cardona, David [104] see Tanasi, Davide

Carleton, Chris [82] see Rondeau, Rob

Carleton, William (Max Planck Institute for Chemical Ecology) and Rob Rondeau (Simon Fraser University)
[238]

Beringia Underwater: The Search for New Archaeological Sites on the Pacific Northwest Coast

When and how people first arrived in the Americas remains one of Archaeology's greatest mysteries. The earliest archaeological evidence suggests that people migrated from Siberia across the Bering Strait, Beringia, and into Alaska around 14,000 years ago. Where they went from there is still unclear. One hypothesis is that these First Peoples moved down the Pacific Northwest Coast on the, then, mostly exposed continental shelf. Archaeological sites in Alaska and the Yukon suggest that they were big game hunters and that they survived by hunting animals like mammoth, mastodon, and caribou. Around 10,000 years ago, when the last Ice Age ended, sea level rose, flooding what had been a coastal plain to the west of the present coast of Alaska and British Columbia. As a result, potential early archaeological sites are now underwater. This research aims to (1) locate early sites on the underwater landscape and (2) to investigate them firsthand. This presentation outlines how the use of a new computer predictive model developed at Simon Fraser University, combined with the latest underwater surveying techniques and applied technical engineering, will allow us to investigate marine archaeological sites on the Pacific Northwest Coast in ways not previously possible

Carline, Kristin (Center for Advanced Study of Human Paleobiology, George Washington University), Erik Marsh (CONICET, Laboratorio de Paleo-Ecología-Humana), Savanna Buehlman-Barbeau (University of Oregon), Silvina Castro (Laboratorio de Paleo-Ecología-Humana) and Lucía Yebra (Laboratorio de Paleo-Ecología-Humana)
[243]

Semi-Sedentary Foragers in the Uspallata Valley, Argentina

The Uspallata Valley Archaeology Project excavated and surveyed the site Uspallata Norte in the Argentine Andes (32°S, 2000 masl) to study the transition from foraging to pastoralism and agriculture. Lithic analysis from the artifacts collected during the 2016 field school with the Institute for Field Research investigated the raw materials, techniques, and finished lithic products. Macroscopic observation of fragments, specific technological characteristics, and morphological characteristics were analyzed to identify specific stages of the reduction sequence and human mobility patterns. There are many expedient lithic tools made from medium-quality raw materials available at the site, although high-quality raw chert is available in the adjacent mountain range. This suggests groups living here were less mobile, a possibility reinforced by the large quantities of ground stone implements, probable agricultural hoes, retouched multipurpose tools such as perforators, low quantities of ceramic sherds, and surface hearths. Overall, the pattern suggests more intensive occupation, plant processing, and continued duration spent at the site than would be expected for mobile foragers. The adjacent site, Cerro Tunduqueral, has the province's largest density of rock art, which may have been made by the inhabitants of Uspallata Norte.

Carlson, Meredith (University of California, Davis), Christopher Beckham, Caleb Chen (University of California, Davis), Daniel Goring (University of California, Davis) and Peiqi Zhang (University of California, Davis)
[83]

Modeling Time Investment Trade-offs for Stone and Wooden Mortars

California archaeology and ethnography record instances of mortars made from wood. Differences in raw material availability, intended uses, and mobility are major factors that could contribute to preferential manufacture of wooden mortars versus similarly shaped stone mortars. Although previous research finds that wooden mortars take fewer hours to produce than comparably sized stone mortars, the relative costs and benefits of mortars made from these materials remains understudied. Here, we compare experimentally obtained return rates for processing acorns (*Quercus kelloggii*) and Indian ricegrass (*Achnatherum hymenoides*) seeds with two types of wood and stone mortars. Wooden mortars were less effective than stone mortars for processing both acorns and small seeds into flour. This difference was especially pronounced for small seeds. Modeling the costs of manufacture against these results indicates that wooden mortars should never be preferred over stone for grinding small hard seeds like Indian ricegrass, but could have been favored under certain conditions for acorn processing.

Carlson, Meredith [83] see Goring, Daniel

Carlucci, Eric (Indiana University, Bloomington)
[241]

Brewing up Archaeology: Understanding the Intersection of Archaeology and Craft Beer

The use of historical and archaeological iconography, and the invocation of ancient cultures, in order to sell a product is a common marketing strategy. One unique area this intersection of archaeology and capitalism has collided is in craft brewing. As small-scale brewing has grown around the world, some brewers have turned to historic sources and archaeologists to "re-create" certain fermented beverages. For the brewery this is an uncommon opportunity to explore fermentation from a different angle, and for the consumer it provides a hands-on way of experiencing what they perceive as history. However, these beverages have important limitations, and this act has implications for archaeology and for the perception of archaeology in the general public. Looking at chemical analyses, yeast, agriculture, and technology, the link between the historic source and the recreation can be examined at every phase. Understanding the process behind these beverages, their marketing, and how the public experiences them provides an opportunity for archaeologists to engage with the public in a creative, informative, and transparent manner.

Carmean, Kelli (Eastern Kentucky University)**[254]***Spark the Heart First: Archaeological Fiction in the Classroom*

Who among us does not like a good story? How many of us have stayed awake long into the wee hours turning the pages of a novel just to see what happens to our protagonist? This paper argues that archaeological fiction is capable of sparking interest in the hearts and minds of our undergraduate students as well as the general public, in ways that more traditional archaeological publications cannot. Archaeological fiction is able to do this because it engages at a different, more significant level—at the level of the human lived experience—than only at the intellectual level. I present two case studies—one from an undergraduate the other from a member of the general public, from two separate novels—that illustrate this argument. To best succeed in the classroom, I propose that relevant assessments and discussion questions must be carefully developed to direct archaeological learning further, beyond the rise of that initial spark of human story.

Carmichael, Patrick**[21]***Origins of Polychrome Pottery in Nasca Gravelots*

On the south coast of Peru, Nasca polychrome pottery (ca. AD 100–600) is ubiquitous at habitation sites and cemeteries, where one to a dozen or more vessels were included in burials as grave goods. Traditionally, Nasca ceramics, seriated into seven style phases, were used only as chronological markers. But closer examination of the pots found together in a burial reveal clues to their manufacture and circulation. By comparing the quality of associated vessels (construction, slip preparation, painting, burnishing, firing) with artist color preferences and design themes, and anticipated markers for differing scales of production (master potter, family workshop, community of potters) we can ask whether an individual obtained their ceramics from single or multiple sources. A set of adjacent Nasca graves excavated by Alfred Kroeber in 1926 allow us to determine whether the vessels in each grave belonged to the occupant, or were contributed by others. Finally, gravelots answer the question of whether the finest quality polychrome is a marker of high status. In the past, researchers imposed their own interpretations on the ceramic data, while this study allows the data to speak for itself.

Carmody, Stephen [211] see Davis, Jera

Carmody, Stephen [215] see Fields, Mara

Carmody, Stephen [63] see Tolan, Grace

Carpenter, Elsa [5] see Davis, Mary

Carpenter, John [79] see Krug, Andrew

Carpenter, Lacey (Hamilton College)**[150]***Destruction and Reconstruction: New dates from Area M at El Mogote*

The Middle Formative site of El Mogote in Valley of Oaxaca, Mexico was first occupied at least as early as 700 BC and abruptly abandoned around 300 BC. The site consists of a 2.2 ha civic ceremonial plaza and 52.8 ha of residential occupation. Prior to the abrupt abandonment, residents of El Mogote may have engaged in raiding or violent conflict with other settlements or polities. In this poster, I present new radiocarbon dates from the residential sectors at El Mogote to evaluate the likelihood and timing of incidents of raiding. Excavations in Area M revealed that a residential complex east of the civic ceremonial core of the site was destroyed in a fire. New radiocarbon dates help establish a sequence of events and indicate the area was immediately rebuilt. These dates combined with features, artifactual, and architectural evidence indicate the building was destroyed accidentally or during a violent attack as opposed to a ritual closing. Radiocarbon dates also help establish the relationship between this complex and other excavated structures on the civic-ceremonial plaza and in other residential areas.

Carpenter, Lacey [35] see Langston, Jada

Carpenter, Michelle (University of Texas, San Antonio), Robert Hard (University of Texas, San Antonio), James Watson (University of Arizona), Elisa Villalpando (Instituto Nacional de Antropología e Historia) and Raymond Mauldin (University of Texas, San Antonio)
[240]*Stable Isotope Analysis of the Early Agriculture Period at La Playa (SON:F:10:3) Sonora, Mexico*

Stable isotopic analyses of carbon and nitrogen in bone can provide insight into the consumption of plants and animals. Bone collagen differentially tracks the consumption of proteins, and bone apatite is comprehensive of an individual's diet through the intake of lipids, protein, and carbohydrates. Current analyses of 29 individuals from the Early Agricultural period (EAP) site of La Playa (SON:F:10:3), demonstrates occupants were consuming resources that heavily relied on plants with CAM and C₄ photosynthetic pathways throughout the EAP. Analysis of 11 individuals from the San Pedro (3500–2800 BP) phase shows collagen $\delta^{13}\text{C}$ values from -7.6‰ to -10.6‰ and $\delta^{13}\text{C}$ apatite values from -2.7‰ to -7.1‰ . During the subsequent Cienega (2800–1800 BP) phase 18 individuals have collagen $\delta^{13}\text{C}$ values ranging from -8.4‰ to -12.05‰ and $\delta^{13}\text{C}$ apatite values of -3.8‰ to -6.5‰ . Several of these differences are statistically significant. Overall these dietary patterns indicate variability in individual consumption rather than a strong directional shift in diet over time associated with greater investments in maize agriculture. These isotopic results suggest that the exploitation of local CAM resources may have masked the transition to agriculture during the Early Agricultural period in the Sonoran Desert.

Carpenter, Michelle [179] see Mauldin, Raymond

Carpenter, Steve [176] see Cody, Mercedes

Carpenter, Steve [194] see Lawrence, Ken

Carpenter, Steve [194] see Miller, Kevin

Carr, Christopher (University of Cincinnati) and Nicholas Dunning (University of Cincinnati)

[20]

A Gypsum Quarry in Alignment with the Ancient Maya Cities of Calakmul and Yaxnohcah, Campeche, Mexico

Two isolated hills are located in an intriguing spatial relationship to the large ancient Maya cities of Calakmul and Yaxnohcah. Structure II at Calakmul is positioned on a line extending from the south hill in a direction 14° clockwise from west. Similarly, the principal Alba Group structure at Yaxnohcah is positioned on a line in a direction 14° clockwise from south. The two lines form a right angle. Further, the axes of structures II and Alba are orientated along their respective lines. These suggestive positions and orientations prompted visits to the hills in 2018 and 2019. On our approach along the flat lands leading to the hills, we encountered a string of occupation sites, the largest of which included a peripheral open plaza strewn with numerous gypsum blocks of all sizes, suggesting the plaza was a gypsum workshop. We explored the south hill which is covered with gypsum quarries: pit quarries dug into the flatter land at the base and top of the hill, and vertical faces with terrace quarries cut into the side of the hill. We describe these features and discuss possible ancient Maya uses for the gypsum output from this large quarry zone.

Carr, Christopher [20] see Brewer, Jeffrey

Carr, Christopher [63] see Frashuer, Anya

Carr, Christopher [99] see Smyth, Heather

Carr, Christopher (Arizona State University)

[99]

Scioto Hopewell Souls and Intercommunity Alliance-Making: Three Worldview Metaphors that Scioto Hopewell Peoples Lived

Hopewellian communities in the Scioto-Paint Creek area established alliances among themselves in part by interring their dead together within single charnel houses in multiple instances; by intermixing the cremation ashes of their dead within a single depository; and by placing, burning, and fusing together within single depositories on multiple occasions their ceremonial paraphernalia from jointly performed rituals. These practices, along with close ethnohistorical analogs, point to the operation of three basic worldview principles—metaphors for the idea of interpersonal cooperation—that were harnessed to build intercommunity alliances: spatially associating souls; blending souls; and the equation of the domicile with a large ceremonial building, mound, and ceremonial center as expressions of the extension of family-like ties and ethics of cooperation to the scales of the community, multiple communities, and the cosmos. Insights are drawn from mortuary and nonmortuary ceremonies of the historic Huron, Cherokee, and Munsee-Delaware and other Woodland tribes.

[99]

Chair

Carr, Philip (University of South Alabama)

[254]

Introduction to Archaeology and Biological Anthropology: Teaching with Team-Based Learning

Introductory archaeology courses that fulfill General Education requirements include a diversity of students and for most students it will be there only formal academic exposure to the subject. Traditional “sage on the stage” pedagogy may not always be the best means of engaging students and deepening their knowledge of archaeology. Team-Based Learning (TBL), a powerful teaching method, has several essential elements: forming permanent teams; flipping the classroom; a specific sequence of individual work and teamwork, and immediate feedback. Implementation of TBL is discussed and lessons learned are reviewed. Comparison between student work from the traditional and TBL class show no significant differences. Data show that TBL created a motivational framework in which students increasingly held each other accountable for coming to class prepared and contributing, which resulted in higher class performance as well as fewer withdrawals.

Carr, Sarah and Stephen Silliman (University of Massachusetts, Boston)

[112]

Housing a Reservation: Eastern Pequot Architectural Investment and Use in Nineteenth-Century Connecticut

This paper examines internal variation related to architecture from three nineteenth-century Eastern Pequot domestic structures on the Eastern Pequot Reservation in North Stonington, Connecticut. Two of these building remnants highlight commonalities between household architectural styles, while the third shows a significant increase in architectural investment in terms of size and fenestration. We explore the reasons for this contemporaneous variation, especially in relation to other material investments of the household. Analysis of household features and associated spaces, window glass, and ceramics from three houses occupied around the same time will inform to what extent indigenous negotiation of colonial markets and Anglo overseer administration influenced building construction and use across the reservation. Understanding heterogeneity on the reservation helps move further away from monolithic characterizations of indigenous communities in studies of colonial impact.

Carrasco, Michael (Florida State University)**[141]***Meaning, Aesthetics, and the Origin of Precolumbian Art in Terence Grieder's Thought*

Terence Grieder often discussed aesthetics, the act of making, and the materiality of images and objects. He developed these issues through his work on rock art, ceramics, textiles, and architecture over a highly productive career in art history and archaeology. One of his many contributions was to establish ways of accessing meaning from images and objects that lack accompanying texts. He worked to show that there was a complex alternation between the continuity and disjunction of meaning across time, in contradistinction to George Kubler's insistence on the radical disjunction of meaning. Moreover, his focus on aesthetics in indigenous artistic systems underscored the fundamental role of expressive culture as central to the human condition, rather than as simply a collection of iconographic motifs to be read. This paper critically examines and extends these and other key ideas on representation, the origins of art, and issues of materiality and meaning. It places Grieder's ideas on these issues in relation to recent studies in precolumbian art that have dealt with similar theoretical questions, and to the work of Alfred Gell, who also emphasized process and agency and sought to unravel how meaning resides in images and things.

Carrasco, Michael [191] see Englehardt, Joshua

Carré, Matthieu [67] see Gruver, Steph

Carreón Blaine, Emilie (Instituto de Investigaciones Estéticas UNAM)**[225]***Mesoamerican Ballgame, Human Sacrifice, Ritual Decapitation, and Trophy Taking: Variations in Ways of Displaying*

The purpose of this collaboration is to present the results of the analysis of a human skull located at the center of the ball court of Santa Rosa, Chiapas, and to review the implications it presents for the study of the Mesoamerican ball game and its relationship to human sacrifice. It is a unique case in which hard archaeological data directly associates a skull with the ball game. It will allow for the review of the widespread proposal linking the ball court with the tzompantli, and will serve as a basis to present the many manners in which human body parts, primarily the head, were displayed to explore how Mesoamerican peoples appropriated and adapted what were Culture Area-wide paradigms in thought and behavior.

Carroll, Jon (Oakland University)**[222]***Exploring the Natchez Paradox through Computer Simulation*

The nature of Natchez of sociopolitical organization has been debated by researchers since at least the early twentieth century. The mechanisms for how precontact people were able to accumulate or lose status within their communities are not fully understood. This discussion uses Agent Based Modeling to explore competing ideas of sociopolitical rank exogamy proposed for the Natchez communities of the lower Mississippi Valley. The software package NetLogo is used to generate probabilities for for each competing scenario.

Carroll, Peyton (University of Cambridge), Miles Martin (Stanford University Heritage and Resource Management), John Murray (School of Human Evolution and Social Change) and Curtis Marean (African Centre for Coastal Palaeoscience)**[38]***Comparing Piece-Plotted and Sieved Stone Artifacts from the Middle Stone Age Site Pinnacle Point 5–6 and Its Implications for Interpreting Human Behavior*

Archaeological field work is a time consuming and destructive process. Thus, the primary goal of excavation is to meticulously document as much information about the site and artifacts as possible. In Paleolithic archaeology, it is common for archaeologists to use a total station to record the spatial location of artifacts (=piece-plotting) and employ a post-excavation sieving protocol for small finds that were not plotted by the excavator. A significant amount of work is invested in finding, cleaning, and analyzing these small artifacts. In this research, we investigate whether there are biases in artifact assemblages that were piece-plotted in situ and those found within the small finds at the Middle Stone Age site, Pinnacle Point 5–6, on the coast of South Africa. We analyzed artifacts found in the 10mm sieve from units dated to the MIS 5 to MIS 4 transition and compared them to the piece plotted artifacts that correspond to these units. Our goal is to see if there are differences in assemblage composition between the plotted and screened data. These results have implications for archaeological excavation and analysis protocols, particularly regarding small finds.

Carroll, Sean (Oregon State University) and Loren Davis (Oregon State University)**[195]***Preliminary Results of a Geometric Morphometric Analysis of Fluted Points within the Far West*

While Clovis points are said to represent "the best documented early human settlement in the New World" (see Sholts et al. 2012), there is considerable controversy over observed variation in Clovis points. While some, such as Collins (1999), claim that there is a standardized Clovis manufacturing technology, others claim that there is regional morphological variation in Clovis points (Sholts et al. 2012). This presentation presents the preliminary results of an analysis implementing a novel approach in lithic morphometric analysis to statistically quantify the amount of morphometric variation observed in fluted points of the Far West. While the potential for regional variation in fluted point morphology has been previously noted, existing research does not sufficiently address the statistical extent of this variation. In the past, understanding variation in lithic analysis has been restricted to physical artifact measurements using hand calipers. The result is a series of subjective measurements that often vary between individual researchers. The research presented aims to provide a systematic approach to lithic analysis that can not only be used to understand the morphometric variation in the fluted points of the Far West, but which can also be applied to lithic analysis beyond the extent of this project.

Carson, Mike (Micronesian Area Research Center [MARC])**[140]***Paleolandscapes Reveal Potential for Sustainable Living: Examples in Pacific Oceania*

Paleolandscape studies in Pacific Oceania reveal how people adapted through a few thousand years of their transforming inhabited landscapes, living through change in climate, sea level, coastal morphology, slope erosion-deposition patterns, forest composition, freshwater accessibility, population densities, technological developments, and social structure. In different places and time periods, the records show how people were variably successful versus unsuccessful in either sustaining their lifeways or else accommodating new traditions of how to continue inhabiting their landscapes. Selected paleolandscape examples in Pacific Oceania are reviewed here, toward identifying the factors that may be relevant for coping with current and future issues of changing climate, resource distributions, and population dynamics at a global scale.

[140]*Chair***Carson, Mike (Micronesian Area Research Center [MARC])****[219]***Discussant*

Carter, Benjamin [257] see Vance, Ashley

Carter, Nicholas (Harvard University)**[130]***Lords of the Five Lands: The Ho'kab' Dynasty in Ancient Maya Political History*

The Ho'kab' dynasty, based at the sites of Ixtutz and Ixtonton near the modern town of Dolores, Guatemala, played an important role in the ancient political and economic history of the western Maya Mountains. The details of that history are still being worked out, but newly published inscriptions and imaging techniques applied to previously known objects provide new data. In this presentation, I explore the epigraphic and archaeological evidence for the kingdom's trajectory from the Late Preclassic to the Terminal Classic period, including insights into the hows and whys of the Ho'kab' kingdom's foundation, its interactions with other polities, and its survival late into the period of the lowland Maya collapse.

Carter, Sidney**[255]***A Geoarchaeological Perspective on Ceramics as Records of Archaeological Landscapes*

Many approaches to theorizing and analyzing landscapes delineate cultural traces that are ingrained in natural spaces. This orientation is prominent in landscape archaeology of the American Southwest. In contrast, the geoarchaeological research on ceramic resource procurement conducted as part of the Upper Basin Archaeological Research Project is predicated on an inversion of perspective relative to these investigations. Whereas Fairley (2003:108), for example, aims to study "cultural behaviors" in the Grand Canyon region of northern Arizona by "examining the traces of human activities embedded in the landscape," we seek to understand such behaviors by examining the traces of the geological components of the landscape embedded in the products of human activities. Informed by Alan Sullivan's approach to the archaeological record as independent source of information about the cultural past, we combine petrography and isotope geochemistry to evaluate the geological identities of ceramic raw materials in an effort to reconstruct patterns of ceramic resource procurement in landscapes of the eastern Grand Canyon region. As a counterpoint to previous reconstructions of territories defined by ceramic distributions, we offer an evaluation of ceramics as records of landscapes that are embodied through incorporation into archaeological materials.

Cartwright, Rachel (University of Minnesota)**[85]***Settler and Local Dynamics during the Viking Age Diaspora: New Research on Northern Scotland*

Migrations are a phenomenon occurring throughout human history with each movement of people bringing different groups into contact. This paper will be looking at the Viking Diaspora and the interactions between local inhabitants and the arriving Scandinavian settlers, with a particular focus on Northern Scotland. There has long been a debate as to the nature of relations between the Scandinavian settlers and the Picts, with two types of interactions being proposed: genocide or assimilation. This paper seeks to reconcile these two extreme viewpoints. In order to try for a more balanced interpretation this paper explores the archaeological evidence from Orkney and Caithness, places known to have been inhabited by the Picts and the Vikings simultaneously. By exploring the settlement and burial evidence from several sites a more unbiased approach to the archaeology is sought, providing insight into the lived experience of both the settlers and the locals.

Caruso, Annie**[160]***Decolonizing Archaeology through Ethnography: Source Community Responses to Euro-American Archaeological Practices in the Eastern Caribbean*

Archaeological practices were developed through colonial powers and remain intimately affiliated with Euro-American ways of knowing the world. As such, academic practitioners from the Global North maintain the power to construct authorized heritage discourses about indigenous and subaltern peoples around the world, which may also include the physical appropriation of cultural material or human remains from spaces lacking certain heritage protection mechanisms. However, decolonial research rooted in the voices of historically marginalized indigenous and subaltern stakeholders can illuminate and redress such ongoing power

asymmetries toward the goal of yielding more equitable and sustainable research practices among source communities. This paper highlights the ways in which ethnography has been used to critically examine the complex contact zone created by visiting Euro-American researchers excavating pre-contact indigenous settlements on a small Caribbean island with a majority Afro-Antillean population. The research presented here platforms subaltern source community responses to such archaeological intervention and includes a discussion of the overlapping and diverging visions of heritage preservation and collections care for excavated material between diverse stakeholders. In the end, local recommendations for heritage management reforms are synthesized, which include actionable remedies that potential visiting archaeologists may implement in response to community input.

Caruso, Annie [160] see Sloan, Anna

Carvajal López, José (University of Leicester)

[196]

All That Glitters Is Not Glaze: The Islamization of Pots in Early Medieval Iberia

Islamic ceramic traditions in pottery are almost unanimously identified with glazes and dazzling decorations. In this paper, however, I want to explore the beginnings of Islamic ceramics in Iberia by leaving glaze in a second plane, and focus mainly on the changes in technologies of forming and clay mixing. After all, the arrival of Muslims in Iberia happened in 711, more than 150 years before the first glazed pots were produced, and there was a process of Islamization since then. In my technological analysis of the pots, I will explore the period between the eighth and the tenth centuries CE, and I will present some of the ways in which the construction of common ground and difference were made with material culture in a process of culture change. This is clearly visible when technological features, the result of particular steps in the chaîne opératoire, can be seen to be adopted as popular or discarded as obsolete in the transmission of knowledge of pots in a region. From the perspective that I propose, Islamic ceramics are those pots that are product, but also origin and support, of the processes of Islamization in Iberia.

Carvalho, Milena (University of New Mexico, ICArEHB), Grace Ellis (Colorado State University) and Jonathan Haws (University of Louisville, ICArEHB)

[36]

Subsistence and Site Formation Processes during the Early Upper Paleolithic at Lapa do Picareiro: A Study of Faunal Remains Recovered at the Sieve

Modern excavation techniques often result in faunal assemblages comprised of individual bones whose provenience has been recorded using a total station and remains recovered at the sieve (e.g., micro-fragments, small taxa). Typically, faunal remains recovered during sieving are not prioritized in zooarchaeological study and end up not contributing to the interpretation of deposits. However, studies show that by analyzing the micro-fragment and sieved portion of faunal assemblages, archaeologists can gain more information about the formation of palimpsests and identify human activities such as grease rendering, meat and marrow processing, and the exploitation of smaller prey items. Here, we present the preliminary results of a zooarchaeological, taphonomic and spatial study of the micro-fragment and sieved portions of faunal assemblages that correspond to Aurignacian and Gravettian deposits (levels U-DD) from the Paleolithic site Lapa do Picareiro. Picareiro is a cave site in Portugal with deposits spanning the Middle to Upper Paleolithic transition, well established chronology and large collection of artifacts and ecofacts. The results of this study will contribute to a greater understanding of the subsistence practices of early Upper Paleolithic hominins in Portuguese Estremadura and the site formation processes of Picareiro, and more generally, caves.

Carvalho, Milena [11] see Haws, Jonathan

Carvey, Andrea (DrumFire, Visual Communications)

[147]

Virtual Reality and Augmented Reality Applications in Archaeology

Virtual Reality and Augmented are poised to become essential aspects of archaeological investigation. We review past and current explorations, including the equipment and software available. Future applications for visualizing archaeological data will be explored in keeping with the SAA Principles of Archaeological Ethics.

Casal, Fernando (University of Texas, Austin), Timothy Beach (University of Texas, Austin) and Colin Doyle (University of Texas, Austin)

[8]

Soil, Sediments, and Great Waters: The Tabasco Project and Mesoamerican Cultural Origins

Analyzing geomorphology broadly and soils and sediments specifically are integral to understanding water and soil management in the Middle Preclassic around the site of Aguada Fenix, Tabasco, Mexico. This poster presents the soil and water chemistry of Aguada Fenix based on samples collected in 2018 in three main excavations. The laboratory analyses include soil and water elemental, compound, and mineral composition, as well as soil carbon isotopes and typical soil and sediment analyses. This is part of a broader project based in Anthropology at the University of Arizona that examines the origins of Mesoamerican civilization. The parallel project presented here uses geoarchaeological and soil analysis to help understand the the Archaic and Preclassic evolution of water management and agriculture in this key region. This is a key region because of the early evolution of monumental architecture in this convergence zone of the great rivers of Mesoamerica, including Mexico's largest river, the Usumacinta.

Casana, Jesse (Dartmouth College) and Madeleine McLeester (University of Notre Dame)

[124]

The State of the Field: Emerging Approaches to the Archaeology of Agricultural Landscapes

Twenty-five years ago, Naomi Miller and Kathryn Gleason edited the seminal volume, *The Archaeology of Garden and Field*, an authoritative guide to the identification and interpretation of archaeological field systems and other evidence of past agricultural practice inscribed within the landscape. This paper reviews the state of the field today, overviewing a suite of emerging methods that are revolutionizing how archaeologists find ancient field systems, including recent advances in aerial, satellite, and ground-based remote sensing, as well as complementary geochemical and archaeobotanical approaches. This paper situates the critical urgency for archaeological understandings of past agricultural land use practices within contemporary theoretical discourses exploring the entanglements of humans with their environment as well as the transdisciplinary debate surrounding the establishment and definition of the Anthropocene as a geologic epoch. Herein, we argue for the importance of archaeological investigations of fields that prioritize discovery and interpretation of relict fields and their constitution within larger landscapes, both as a means to better understand people in the past as well as our role as a species in shaping global ecosystems.

[124]

Chair

Casana, Jesse [147] see Hill, Austin

Casana, Jesse [124] see Laugier, Elise Jakob

Casar, Isabel [225] see Ruiz, Judith

Casar, Isabel [233] see Somerville, Andrew

Cascalheira, João (ICArEHB, University of Algarve), Celia Gonçalves (ICArEHB, University of Algarve), Lino André (ICArEHB, University of Algarve) and Nuno Bicho (ICArEHB, University of Algarve)

[34]

Functionality and the Spatio-Temporal Variability of a Shell Midden: Insights from Cabeço da Amoreira (Muge, Portugal)

Shell middens are frequently regarded as mono-functional sites resulting from the sequential accumulation of discarded food items. In Central Portugal, on the contrary, due to their large size, an incredible number of artifacts and human burials, the Muge Mesolithic shell middens have always been thought as representing extensive residential occupations. However, very little evidence was available on the set of activities, and correspondent spatial arrangement, occurring at each site. Ongoing excavations at Cabeço da Amoreira (one of the largest shell middens in Muge) allowed the identification of a very diverse set of shell-rich and shell-free stratigraphic contexts, possibly indicating the occurrence of functionally diverse areas within the site. This poster presents a first quantitative assessment and comparison of the archaeological contents of each of these contexts, providing new data on the spatio-temporal variation and functional organization of Mesolithic shell middens.

Cascalheira, João [250] see Bicho, Nuno

Cascalheira, João [34] see Gonçalves, Célia

Cascalheira, João [11] see Haws, Jonathan

Caseldine, Christopher (Arizona State University)

[99]

Soul Journeys to Afterlives: A Systematic Survey of Postcolonial Woodland and Plains Native American Ideas in Oral Narratives as a Foundation for Precolonial Mortuary Studies

Symbolically rich mortuary remains from prehistoric Woodlands and Plains societies in North America offer ripe opportunities for inferring past eschatologies when integrated with analogous native ethnohistorical information. This research approach has been weakened, however, by the lack of systematic characterization and mapping of historic Woodland-Plains eschatological knowledge. A survey of 204 narratives about the journey to an afterlife, drawn from 42 Woodland-Plains tribes, documents a huge suite of motifs (527), their commonness, geographic distributions, and co-occurrences. Twelve distinct journey narratives or narrative segment models, geographically bounded, are revealed. Although a few individual motifs were widespread across subregions, no standardized journey model was found.

Casserley, Tane (NOAA) and David Alberg (NOAA)

[231]

America's Forgotten WWII Battlefield

Beyond Monitor National Marine Sanctuary's (MNMS) current boundaries off North Carolina lie waters associated with nearly 500 years of western maritime history and includes shipwrecks representing coastal heritage, American Civil War, U.S. naval aviation, WWI, and most prominently WWII. MNMS is proposing a boundary expansion to protect and honor these additional resources. MNMS expansion represents an ideal opportunity to celebrate, study, and preserve a nationally significant collection of shipwrecks and would serve as a uniquely accessible underwater museum and memorial to WWII's Battle of the Atlantic. MNMS's expansion boundaries will contain the most publicly accessible collection of WWII shipwrecks near America's shore and would constitute the largest area designated as a WWII battlefield anywhere in the United States. With the 75th anniversary of the close of WWII this is the time to honor the history and sacrifice of Allied servicemen and the U.S. Merchant Marine.

Casson, Aksel (Slippery Rock University) and James Jablonski

[176]

Preliminary Excavations at Wolf Creek, a Prehistoric Site in Western Pennsylvania

We present here a report of initial archaeological excavations of the Wolf Creek Site (College II, 36BT0507), a hypothesized Late Archaic site in Butler County, Pennsylvania, during the summer and fall of 2019. Survey and excavation along portions of Wolf

Creek in Slippery Rock, Pennsylvania, suggest a series of short-term occupations extending from the Late Archaic to historic periods. This preliminary interpretation is based on the identification of multiple hearth features and moderate quantities of flakes and debitage of local chert, including concentrations of tertiary flakes that we believe to be consistent with Late Archaic patterns. This project is a collaboration between Slippery Rock University student volunteers, retired professional archaeologists, and amateur local archaeologists as part of a larger effort by the university's anthropology program to develop service learning and community engagement opportunities in Butler County.

Castañeda, Amanda (Wyoming State Historic Preservation Office) and Mark Willis (Mark D. Willis Consulting)

[79]

Exploring Ground Stone Bedrock Feature Variation on the Mescalero Plain, New Mexico

Recent cultural resource management investigations east of Carlsbad, New Mexico on the Mescalero Plain resulted in the identification and documentation of almost 300 ground stone bedrock features. The features within this sample have a wide variety of morphologies, ranging from tiny cupules (~2 cm in diameter) to very large basins (~35 cm in diameter). Given the variation of documented features, preliminary observations show that approximately 50% of the sample has a distinct and consistent morphology, resembling "boat mortars" found on the Llano Estacado in Texas. This morphological uniformity suggests a pattern in food processing and resource procurement activities that may yield information regarding lifeways in the region. The recorded bedrock features occur at sites varying in age from the Late Prehistoric Ochoa Phase, although other associations may be present. The regional flora is characterized by mesquite, shinnery oak, and a variety of grasses—all of which may have been processed in these bedrock features. This poster presents the morphological types of the sampled bedrock features and examines them in conjunction with macroscopic use-wear analysis, known age associations, hypotheses about functionality, and comparison to bedrock feature morphologies in the surrounding regions.

Castañeda, Francisco [269] see Acuña, Mary Jane

Castañeda, Quetzil (OSEA Open School of Ethnography & Anthropology)

[57]

Discussant

Castillo, Luis Jaime [242] see Schofield, Abigail

Castillo, Nina and Giancarlo Marcone

[105]

Los Pescadores de Cerro Azul, un Caso de la Costa Centro Sur del Peru

En la década de 1980, la arqueóloga Joyce Marcus realizó una serie de excavaciones en el sitio arqueológico de Cerro Azul, identificado como El Huarco, ubicado en la parte baja del valle de Cañete. Uno de los objetivos principales fue el definir la existencia o no de especialización productiva, en específico pesquera, asociada al sitio. Marcus halla una serie de elementos que evidencian una especialización productiva, que incluye áreas de procesamiento de pescado, herramientas especializadas y, además, propone un sistema de distribución del mismo, que implicaba caravanas de llamas. Sin cuestionar la especialización económica del sitio Cerro Azul hacia la producción marítima y en base a la revisión de crónicas, investigaciones pasadas y la evidencia recuperada en las primeras dos temporadas de excavación en el sitio arqueológico El Huarco, el presente artículo pretende llamar la atención a los posibles significados adicionales que pueda tener la pesca en un sitio como Cerro Azul y que van más allá de una funcionalidad económica.

Castillo, Nina [224] see Marcone, Giancarlo

Castleberry, Cala (Northern Arizona University), Nicholas Laluk (Northern Arizona University), Vernelda Grant (San Carlos Apache Tribe) and Vanessa Nosie (San Carlos Apache Tribe)

[184]

We are the Land: TCP Nominations, Activism, Politics and Spirituality in Protecting Apache Sacred Places

Tribal Nations in the continental U.S. are increasingly attempting to nominate sacred places as Traditional Cultural Properties (TCPs) onto the National Register of Historic Places. The nomination of a TCP offers an opportunity for a more in-depth consideration of what constitutes a place to tribal communities, specifically by the recognition of cultural importance which can aid in Federal decision-making processes. However, the act of nominating a TCP is questioned by some federal employees because it offers no real protection from desecration or destruction. Given the limitations of overall TCP protective procedures various tribal entities including the San Carlos and White Mountain Apache tribes have employed alternative protective strategies including the work of non-profit activist groups such as the Apache-Stronghold. This poster examines how both the White Mountain and San Carlos Apache Tribal Historic Preservation programs navigate various politics and policies in reference to TCP nominations. Moreover, discussions of the Apache-Stronghold's fight to protect and preserve Ch'chil Bitdagoteel (Oak Flat) provide a powerful window into Apache epistemologies associated to place, identity and overall future well-being.

Castro, Andrey [161] see Kipnis, Renato

Castro, Silvina [243] see Carline, Kristin

Castro-Priego, Manuel (Alcala University), Lauro Olmo-Enciso (Alcala University) and Marcos Octavio Labrada-Ochoa (Instituto Nacional de Patrimonio Cultural del Ecuador)

[257]

Perduraciones prehispánicas y conformación del paisaje colonial en la costa Ecuatoriana en los siglos XVI y XVII

El proyecto "Perduraciones, continuidad y ruptura" se desarrolla desde el año 2018 en la provincia de Manabí, Ecuador. La investigación se centra en la identificación de la cultura material, organización espacial y procesos de perduración prehispánicos durante el periodo inicial de la colonia (ss. XVI y XVII) a lo largo de un amplio sector de la costa central ecuatoriana. Se presentan los resultados obtenidos fruto de la comparación de contextos arqueológicos de cronología manteña tardía (ss. XV-XVI), procedentes del yacimiento de Ligüiki (Cantón Manta) y Cerro de Hojas (Picoazá, Portoviejo), con las primeras fases coloniales de la ciudad de Portoviejo (ss. XVI y XVII). Se analizan también las características del yacimiento de Ligüiki, y se ofrece una primera secuencia cronológica, así como una interpretación de los espacios productivos y habitacionales, que debieron conformar su paisaje social e histórico a comienzos del siglo XVI.

Cates, Kari [129] see Conrad, Cyler

Cathcart, Danielle

[172]

Warehousing the Past: Are We Doing the Right Thing?

The cultural resource management industry, emerging from the passage of landmark national and subsequent state-level legislation, is arguably one of the largest generators of archaeological collections in North America. Project-specific deadlines, budgetary constraints, variations in state agency guidelines, and the realities of property ownership, present CRM companies with an ethical dilemma that has resulted in collections remaining in limbo, or worse, orphaned in warehouses across the country. Often a collection's owner is reluctant or unable to shoulder the costs of long-term curation elevating the risk of total collection abandonment or loss. While the fate of federally-owned collections is never in question, the bulk of many firms' collections originate from private, state, or municipal lands. The dearth of private, local or state-run repositories able to accept new collections compels CRM firms and local historical societies to function as de-facto repositories with little to no mandate or financial support to do so. Richard Grubb and Associates, Inc., in operation since 1988, is keenly aware of the chronic and immediate nature of these issues. This paper will share RGA's strategy, successes, and challenges in navigating these murky waters.

Catlin, Kathryn (Brown University)

[272]

Political Ecology Materialized in a Medieval Icelandic Landscape

Past ecological and political-economic changes are embedded in the materiality of the landscape, and investigating correlations between such changes can suggest how relationships between ecology and economy were structured and managed within past societies. Iceland was first settled in the late ninth century by wealthy Norwegian farmers and their households, whose early efforts rapidly transformed the island from forested wilderness to pastoral landscape. The environmental impact of this settlement is materially evident, as deforestation and erosion. A regional archaeological survey of medieval settlements shows that as environmental degradation reached a turning point, people were leaving the very smallest settlements, moving to join larger farming households. The abandonment of small settlements illustrates a shift in the way social inequality was organized: early social differences were largest within households, while later status differences were most evident between households, as land ownership became the dominant source of wealth and power. Correlating material evidence of environmental change with that of changing settlement patterns suggests that the rise of inter-household inequality, and its accompanying political and economic institutions, was enabled and encouraged by landscape transformation. Such an observation is possible only when the full materiality of the landscape is considered.

Cawthra, Hayley [11] see Fisher, Erich

Cegielski, Wendy (Arizona State University)

[17]

Automated, Geometric Morphometrics of Iberian Bronze Age Ceramic Rims

Ceramics often are the most prevalent artifact type on archaeological sites, making them a useful tool for chronology-building. However, ceramic assemblages often lack obvious chronologically, diagnostic traits necessitating a more nuanced, classification approach. A long-used method in Archaeology, Geometric Morphometrics classifies shapes using standardized Cartesian landmark points and statistical analysis. This project presents a case study of a computational, automated approach to Geometric Morphometrics of already published, 2D ceramic profiles of rim fragments from the Iberian Bronze Age. The computation uses a curvature function and oscillating circle algorithm, commonly deployed in automated image classification. Results are compared to a benchmark geometric morphometric analysis conducted in the 1990s of the same dataset using clustering/PCA.

Celestine, Bryant

[113]

Moderator

Celhar, Martina [85] see Zaro, Gregory

Celis, Ana [137] see de Anda, Guillermo

Cencig, Elsa [50] see Ryan, Karen

Cercone, Ashley (University at Buffalo)

[263]

Potter's Wheel, Potter's Mold, and Coil-Made: Examining Potting Technologies Using Morphometrics

Although the study of morphometrics has a long history in the subfield of physical/biological anthropology, archaeologists have just begun to incorporate morphometrics in their studies of material culture. In recent years, archaeologists have utilized morphometrics to determine the level of craft specialization at prehistoric, test the symmetry of stone tools, classify ceramic sherds, examine the level of production standardization, and overall study the change of an artifact type over time and space. This paper discusses how morphometrics can be applied to archaeological ceramics to examine the morphological variability between potting technologies and utilized to possibly determine the technology that was used to create the pot.

Cerezo-Román, Jessica (University of Oklahoma)

[79]

Embodiment and Regional Patterns of Hohokam Mortuary Practices

This paper explores notions of embodiment within regional patterns of Hohokam mortuary practices from the Preclassic (AD 700–1150) to Classic periods (AD 1150–1450/1500). Hohokam mortuary rituals from Tucson and Phoenix basin sites are contrasted and compared by analyzing osteological profiles of the individuals, posthumous treatments of the body, and in the cases of cremation, thermal alterations. Preliminary results suggest strong similarities between Tucson and Phoenix area mortuary rituals and ideas about the body in the Preclassic Period. Cremation was the main funeral custom with an emphasis on secondary deposition. However, during the Classic Period, practices in the areas diverge significantly. Inhumation became the primary burial custom in the Phoenix basin while Tucson basin Hohokam continued cremation as the main mortuary custom. Changes in mortuary practices between the regions could represent changes in perceptions of embodiment, different tempos, and ways of treating the bodies, but also possibly parallel commemorative rituals.

Cerezo-Román, Jessica [240] see Edington, Stacy

Cerezo-Román, Jessica [38] see Hanson, Annalys

Cesaretti, Rudolf (Arizona State University), Carlos Cordova (Oklahoma State University) and Charles Frederick

[269]

Analysis and Implications of Postdepositional Bias in the Basin of Mexico (BOM) Surveys: A Preliminary Case Study of the Texcoco Survey Region

The Basin of Mexico (BOM) regional surveys have been a cornerstone of archaeological inferences about Prehispanic demography, political, and economic organization over the long-term. However, recent geoarchaeological fieldwork in the BOM has indicated patterned geomorphological biases in the regional surveys, notably the repeated phases of Holocene alluvial deposition obscuring remnants of Prehispanic landscapes from surface survey. This preliminary study uses geophysical techniques to analyze and estimate postdepositional biases in the Texcoco survey region data. Survey data, 5m lidar DEMs, and other INEGI geospatial data clearly detect the geomorphic features documented in fieldwork, enabling us to map the signatures of past geomorphic processes. Using these process-based geomorphic signatures, machine learning, and non-linear regression, we model the probability and degree of postdepositional bias. This highlights areas where surface sites would be obscured by deposition and modern land use (both at the time of the survey and today). Early sixteenth-century ethnohistoric data then facilitate the predictive modeling of Aztec settlement corrected for the estimated error in survey site recovery. These techniques highlight the potential magnitude and theoretical implications of systematic biases in the BOM survey data, as well as identify fruitful areas for excavation and subsurface remote sensing.

Chacaltana-Cortez, Sofia (Universidad Antonio Ruiz de Montoya)

[32]

Discussant

Chadwick, William [213] see Ford, Ben

Challis, Sam (Rock Art Research Institute, South Africa) and Brent Sinclair-Thomson (Rock Art Research Institute)

[60]

The Disconnect: The Impact of Contact and Colonization on the Indigenous Worldview, Rock Art, and History in Southern Africa

The archaeological record undergoes a dramatic shift in appearance whenever indigenous peoples encounter incoming populations—whether in the form of altered economy, altered politics, or altered identity. Rock art in southern Africa testifies to successive interactions between hunter-gatherers, incoming African herders, and African farmers from around 2,000 years ago, as well as later European settlers. New subject matter, however, is not simply incorporated into the existing tradition. Without

exception, the many rock arts that depict novel motifs are made differently from the “traditional corpus”—usually rougher (in both paintings and engravings), more dynamic, or with vivid and chalky paints. The drop in pigment quality is likely owing to the decimation of indigenous groups and the subsequent breakdown in trade communications. The shifts in manner of depiction and the ways in which motifs are treated owes more, it seems, to the increasingly heterogeneous and creolizing membership of the art-producing people and the mixing of their cosmologies.

Chamalian, Zaynab (University of South Florida) and Karen Schollmeyer (Archaeology Southwest)

[122]

Floor Features and Room Closure Deposits at Cliff Phase Salado Sites in Southwest New Mexico

Seven field seasons of the Archaeology Southwest and University of Arizona's Preservation Archaeology Field School have produced an abundance of archaeological data from Cliff Phase (1300–1450 AD) sites near the upper Gila River. The Cliff phase is marked by the migration of Kayenta groups, originally from northeastern Arizona, and Salado ideological coalescence associated with their settlement in this area. This poster uses data from recent excavations and published reports to examine room floor deposits, floor features, and special deposits associated with room closure activities in adobe rooms and roomblocks. These deposits include mealing features, concentrations of the remains of birds and fish, and various styles of pottery, including Salado polychromes. Examining these deposits from an intrasite perspective and the Gila River Farm site and an intersite perspective in the broader upper Gila area allow new insights into how these distinctive deposits reveal the intersection of Mogollon and Kayenta influences in Cliff phase archaeological sites.

Chamussy, Vincent (UMR 8096 Archéologie des Amériques [CNRS-Paris 1]), Nicolas Goepfert (CNRS, UMR 8096 Archéologie des Amériques) and Romuald Housse (Université Paris 1 Panthéon-Sorbonne, UMR 8096)

[174]

Was Huarás (White-on-Red) a New Culture or the Revival of Chavín Culture?

The collapse of Chavín culture is still subject to various speculations and the setting up of the so called White-on Red Culture (Huarás) on the ruins of the Chavín temple has not been subject of specific studies to date. In contrast, a significant set of data makes clear that it has predated the collapse of Early Horizon culture (the former coastal Chavín) on the northern coast of Peru. We propose the following scenario: the invasion by an ethnic group bearing a new culture evidenced by innovative cultural features. This intrusion would have taken place during an “Overlap Period” (400 BC–AD 0) corresponding to the end of the Early Horizon and the beginning of the Early Intermediate Period. This group brought about confrontation with the ethnics groups already living on the highlands and the coast, and progressively acculturated these populations by an ethnogenesis process. This new culture includes Cajamarca 1 and 2, Layzón, Salinar, Puerto Moorin, Patazca, Huarás, San Blas, Baños de Boza, which gradually replaced the former Early Horizon traditions. This arrival is concomitant with an important cultural shift, highly visible in new weapons, ceramic morphology and decoration, iconography, architecture, funerary practices, and metal work.

Chandler, Susan

[31]

Discussant

Chandler, Susan

[58]

The Role of Cultural Resource Management in Archaeological Research: A Case Study from the Western United States

This paper explores the transformation of one CRM firm in the context of the CRM industry in the western United States from the late 1970s to today. It focuses on how CRM can and should lead the archaeological profession in meaningful and innovative archaeological research. Since Alpine Archaeological Consultants (Alpine) was founded in 1987 by the husband-wife team of Alan Reed and Susan Chandler and their business partner, Jonathon Horn, the company has undergone significant growth. This expansion is evident not only in terms of numbers of employees but also in terms of the geographic extent of projects conducted and the range of services offered by the company. Alpine's core mission has been to serve the needs of clients through innovative, timely, and cost-effective strategies that allow projects to be completed within the client's timeframe. At the same time and working in concert with other regional CRM firms, Alpine has prided itself on conducting important archaeological research that has made significant contributions to knowledge of the archaeological record.

[58]

Chair

Chandler, Susan [58] see Douglass, John

Channell, Rachel [65] see Neff, Matthew

Chapa, Reymundo

[52]

Discussant

Chapdelaine, Claude [12] see Gates St-Pierre, Christian

Chapman, Ellen and Victoria Ferguson (Monacan Indian Nation)**[251]***Toward a Decolonized CRM: Challenges in Archaeological Stewardship and Interpretation for Virginia Tribes*

Virginia's landscape for tribal rights and recognition experienced a sea change in the last four years with the long-overdue federal recognition of many of Virginia's tribal communities. Virginia now has seven federally recognized resident tribes, and an additional five tribes have state recognition. Virginian erasures of native history have been created not primarily through physical removal but by state-coordinated demographic erasure, an under-investment in scholarly research for much of the twentieth century, and ignorance regarding community persistence. While cultural resource management represents a critical opportunity for the recovery of aspects of tribal histories, some projects exacerbate this erasure due to flaws such as a lack of research into nineteenth- and twentieth-century tribal history; use of outdated boilerplate language; unqualified contractors receiving work due to low bids or non-competitive contracts; lack of consideration for sites under National Register Criteria A, B, and C; and a general absence of tribal outreach. This paper discusses some examples of recent issues facing Virginia tribes as they consult on federal projects.

Charlton, Michael [239] see Martinez Milantchi, Maria Mercedes

Chase, Adrian (Arizona State University)**[29]***Reconstructing and Testing Neighborhoods at Caracol, Belize*

Neighborhoods in the past formed in urban contexts from the bottom-up through repeated face-to-face interactions. Through these shared social experiences, neighborhood groups would possess a high potential for collective action; facilitating local solutions to issues facing these communities. In addition, these neighborhoods would have possessed higher intra-group cohesion for the above reasons. While we cannot ask the deceased who they interacted with and for how long, we can reconstruct likely zones of repeated face-to-face interaction. Previous methods of neighborhood reconstruction have often utilized clustering algorithms focusing on straight line distance. As such, these methods are not well suited to rugged, hilly landscapes. Instead, this research uses a combination of least cost path and social network analysis to reconstruct neighborhoods for the last phase of occupation at the classic period Maya city of Caracol, Belize. In addition, comparison of caches and burials within plazuela housemound groups sheds additional light on these communities. This excavated material allows for testing of these reconstructed neighborhood boundaries. Four neighborhood zones at Caracol provide a minimal dataset to distinguish the effects of district markets and neighborhood identity and ascertain the validity of this neighborhood reconstruction method for Caracol, Belize.

[29]*Chair***Chase, Adrian (Arizona State University)****[155]***Discussant*

Chase, Adrian [102] see Chase, Arlen

Chase, Arlen (Pomona College), Diane Chase (Claremont Graduate University) and Adrian Chase (Arizona State University)**[102]***Population Estimation in Ancient Mesoamerica: Retrospective and Prospective*

The determination of accurate population numbers for ancient Mesoamerican societies is key for making interpretations about past levels of complexity. This is not only necessary for understanding how societies changed over time but also for how they were organized over space. The techniques that Mesoamericanists use vary depending upon area of research. In the highlands, population numbers are usually determined as a result of surface surveys and estimations of people based on hectares of land that were occupied. In the lowlands, estimations are often based on numbers of mapped mounds and an extrapolation of occupants per mound and area occupied, with change over time often based on dated sherd material recovered through a testing program. The use of different methodologies has led to divergent interpretations about the sizes of ancient Mesoamerican populations and the density of settlement. The addition of lidar helps in defining the limits of centers and settlement, especially in the lowlands, and this technology obviates the former need for extrapolations about settlement extent. How population numbers are determined has implications for interpretations related to urbanism and sociopolitical complexity throughout Mesoamerica. This paper seeks to codify past approaches and present newly viable options for approaching ancient population histories.

[102]*Chair*

Chase, Arlen [54] see Chase, Diane

Chase, Arlen [102] see Chase, Elyse

Chase, Diane (Claremont Graduate University) and Arlen Chase (Pomona College, Claremont)**[54]***Economy and Sociopolitical Change at Classic Period Caracol, Belize*

Maya economic systems were neither static nor simplistic. Research at Caracol, Belize has shown that the site's Late Classic inhabitants received the bulk of their goods and services from markets that were embedded within the city. Whereas some researchers have postulated the existence of a dual economic system for the Maya in which quotidian and prestige goods operated within different realms, the goods that were distributed through Caracol's Late Classic Period markets do not support the division of the economic system into two units: tradewares and ritual items had widespread distribution in residential groups at the site. The

urban landscape of Caracol manifests continuous agricultural terracing dotted with numerous residential groups. The site's causeways join the outlying public architecture to the city's central hub providing ready passage across the site. The large plazas at these outlying nodes permitted not only easy access to goods and services but the assembly of numerous people. Thus, the Late Classic Period economic system and markets served to integrate the site's inhabitants. However, Caracol's socioeconomic system was dynamic and changed dramatically in the subsequent Terminal Classic Period, when greater socioeconomic divisions existed and elite and non-elite members of society accessed largely different material items.

Chase, Diane [102] see Chase, Arlen

Chase, Elyse (Stanford University), Adrian Chase (Arizona State University), Diane Chase (Claremont Graduate University) and Arlen Chase (Pomona College)

[102]

Population History for Caracol, Belize: Numbers, Complexity, and Urbanism

Caracol, Belize is among the largest known ancient Maya cities. Its urban area spans some 200 km² and is integrated by a series of radial causeways that connect outlying public architecture and plazas to the central hub. The entire landscape is covered by residential settlement and agricultural terracing, making Caracol a truly green city. Excavation and an extensive sampling program at Caracol have demonstrated that almost all residential groups were occupied during the Late Classic Period. Since the early 1990s, the population at CE 650 for Caracol has been estimated as being some 100,000 people. Lidar imagery has confirmed the scale of settlement and various calculations corroborate these numbers. Excavation and sampling further permit a reconstruction of the site's population history. While lidar is an incredible asset for settlement study, comparing intensively mapped settlement areas with lidar imagery reveals that approximately one-third of the lowest-lying structures in Caracol's residential groups are not immediately visible in lidar hillshades. This has implications for the interpretation of lidar hillshades elsewhere and suggests that structure density from on-the-ground mapping will actually be higher than estimates based solely on lidar. However calculated, Caracol's ancient population operated within a complex urban system.

Chase, Josh [186] see Neeley, Michael

Chastain, Matthew

[94]

Bronze-Casting Molds: A Distinct Ceramic Industry in Shang and Zhou Period China?

The manufacture of bronze ritual and military implements in Shang- and Zhou-period (c. 1600–221 BCE) China has received much attention from archaeologists, due in part to the extensive labor mobilization and control of mineral resources needed to sustain production. Scholarly attention has focused largely on two aspects of production: (1) the mining, smelting, and transportation of metal raw materials and (2) the forming and decoration of ceramic casting molds. However, research indicates that the preparation of specialized, high-performance ceramic pastes used to make these casting molds was also an essential stage in the production process. These ceramic pastes were wholly unlike familiar pottery clays in terms of their composition, properties, and methods of production. What practical requirements did the production and use of such unusual ceramic pastes impose on workers? What does this in turn suggest about the organization of production and the degree of connection between casting-mold production and the production of other ceramic items? To address these questions, this talk considers what recent technical studies by the author reveal about the physical behavior of casting-mold pastes, the activities involved in those pastes' production, and the role of technical skill and risk management throughout the production sequence.

Chatelain, David [130] see Ponce, Jocelyne

Chavarria, Sara [160] see Knox, Corey

Chavarria, Sara [184] see Molinares, Stephen

Chavarria, Sara [184] see Viola, Tony, IV

Chavez, Franklin (BIA Special Agent)

[49]

Archaeological Collections and the Problem of Institutional Control

Collections control dominance issues in both NAGPRA and other archaeological activity involving Native American or Tribal collections. Ethical standards and issues with research involving tribal collections and lack of tribal collaboration and consultation. Concerns with current NAGPRA Cultural Resource laws, as most laws are inadequate and require change. The session will focus on both helpful and harmful interactions between institutions and tribal nations which highlights their outcomes and potential strategies for future navigation of archaeological research and repatriation efforts.

Chavez, Mark (Texas A&M University), Paloma Cuello del Pozo (Texas A&M University) and Jose Peña (University of South Florida)

[242]

Explorations from El Campanario Archaeological Project: Body Decorations Recovered from Human Remains Excavated at the Santo Domingo Cemetery in Huarmey, Peru

Archaeological evidence shows how important body decorations were amongst past civilizations. Humans have employed different mediums to express identity and ancestral heredity, religious belief, events such as warfare and marriage, and even for therapeutic reasons. In ancient Peru, body decorations in the form of tattooing, ear piercing, cranial modifications and body painting have been

observed. We present three cases of body decorations from the Santo Domingo cemetery, a coastal site in Huarney, Peru, from the Late Intermediate Period. During 2018 and 2019 field seasons, El Campanario Archaeological Project recovered a left radius and two naturally mummified right forearms with articulated ulnae, radiuses and hand bones. All three individuals were at least 19 years of age at death given fusion of proximal epiphyses in ulnae and radiuses. Modern looting prevents us from acquiring more information about these three individuals because no associated skeletons were recovered. The two forearms were decorated with designs in the form of waves and whirlpools located anteriorly and posteriorly as well as in the dorsal side of hands. In addition to body decorations, ceramic art also displays wave-like patterns suggesting the population's close relationship with the coast. This idea is supported by the abundant malacofauna found throughout the cemetery.

Chavez-Chuquimarca, Andrea (PUCE) and Ryan Hechler (Tulane University)

[201]

It Takes a Village? Research Developments in the "Pueblo" Area of Cochasquí

The original Cochasquí archaeological research project established by Udo Oberem in 1964 focused on better understanding functional uses of different areas of the Cochasquí site. The principal objective of past excavations of this area was to understand potential residential structures. Unfortunately, the Pueblo area never yielded actual residential structures nor has evidence of such spaces been found in the region yet. In the area originally referred to Oberem as "Pueblo," we decided to continue excavations from exposed units in our 2019 operation. One focus was trying to better understand poorly articulated stratigraphy of the area and better understand an area that was largely left as a footnote in archaeological reports and publications by Oberem. Detailed profiles and plan drawings have survived, although what was found by Oberem was admittedly peculiar. Through a review of context and material remains, we will better elucidate on an area of Cochasquí that has long been ignored.

Chaytor, Jason [18] see Jones, Douglas

Chechushkov, Igor (Institute of History and Archaeology, UB RAS)

[64]

The Location of the Late-Inuit Winter Sites of the Quebec Lower North Shore and Heat-Preservation Strategies in the Prehistoric Societies

The adaptation to the harsh sub-Arctic environment required from the Eastern Thule Inuit utilizing various types of housing, including subterranean winter houses. The poster presents the results of the field survey of the four late-Inuit winter villages (c. 1500–1700 CE) located along the Quebec Lower North Shore. The survey was conducted to test whether the site locations were chosen specifically to prevent heat loss. The three-stage methodology consists of (1) the detailed mapping of local landscapes, (2) collecting the field data on the prevailing wind direction and speed and, (3) the GIS-modeling to predict the best-located areas that would provide benefits of heat preservation. The modeling revealed the mixed results, suggesting that while some sites were well-protected, others were more exposed to cold winds. However, the overall results demonstrate that the heat-loss protection strategy was a part of the consideration while looking for new winter locations. These results are of the anthropological significance because they have a predictive power to explain settlement patterns in other parts of the world.

Chechushkov, Igor [176] see Almer, Calista

Chechushkov, Igor [50] see Fitzhugh, William

Cheetham, Paul [107] see Ebert, Julia

Cheever, Sylvia (University of Chicago)

[268]

Cranial Modification at the Ocoña-Chorunga River Confluence: Preliminary Insights into the Utility of Modification Data from Looted Contexts in the Ocoña Valley

Corral Redondo is a ceremonial huaca situated where the Ocoña and Chorunga Rivers intersect in the Arequipa region of southern Peru. The Corral Redondo Archaeological Project sought to investigate the use of Corral Redondo within the broader context of human occupation at the Ocoña-Chorunga confluence. The sites surveyed in the polygonal surrounding the confluence exhibit Inka, Chuquibamba, and occasionally Wari characteristics, but the relationships between sites, as well the ways in which they fit into broader imperial political systems constructed by the Inka and Wari, are largely unknown. This paper utilizes data on cranial modification from four looted sites surrounding Corral Redondo to assess the practicality of cranial modification as an investigative vector for intersite interaction in this particular region. This pilot study will attempt to identify patterns indicative of kinship or group identity that may have reinforced community relationships and larger political configurations present while Corral Redondo was in use. Finally, this paper will return to findings reported in 2019, re-evaluating the assertion that seemingly random variation in cranial shape at the site of Jarana indicates modification was a byproduct of daily care of infants rather than a deliberate cue to delineate social grouping in this context.

Cheever, Sylvia [268] see Lozada, Maria

Chen, Caleb (University of California, Davis), Meredith Carlson (University of California), Peiqi Zhang (University of California), Daniel Goring (University of California) and Tammy Buonasera (University of California)

[83]

Using Experimental Archaeology to Compare Energy Expenditures of Mortar and Pestle and Grinding Slab Technologies

Daily activities such as grinding plant material require energy input. It is ideal to put in the least amount of work to obtain the greatest yield of product. Energetic expenditures and returns for grinding slab and mortar and pestle use remain largely unstudied. In this study, resting and grinding heart rate data are recorded and used with grinding efficiency data to determine the best energetic returns for several types of mortars versus a shallow basin grinding slab. These data are further considered along with return rates from two resources, acorn (*Quercus kelloggii*) and Indian ricegrass (*Achnatherum hymenoides*) seed. It is expected that technologies with the highest grinding rates will have the best energetic returns. This may be amplified by differences in caloric values for different resources.

Chen, Caleb [83] see Carlson, Meredith

Chen, Caleb [83] see Zhang, Peiqi

Chen, Jennifer (Pennsylvania State University), Randall Haas (University of California, Davis), BrieAnna Langlie (Binghamton University) and James Watson (Arizona State Museum)
[180]

A Mixed Diet on the Andean Altiplano, 7000 BP

Important subsistence resources like potatoes, quinoa, and vicuña were domesticated in the Andes of South America; however, researchers have yet to clarify the timing and mechanisms of domestication largely due to a lack of archaeological evidence. This research examines the stable light isotope chemistry of human bone alongside paleoethnobotanical and faunal remains from the site of Soro Mik'aya Patxja—a high-elevation archaeological site located on the Andean Altiplano of Peru and dating between 6,500 and 8,000 years ago. These analyses reveal a mixed diet of both meat and plant resources, including vicuña, wild quinoa, and foraged tubers. These findings point to hunter-gatherers practicing a mixed subsistence economy with tuber and grain intensification occurring in the millennia preceding plant and animal domestication.

Chen, Kunlong [42] see Liu, Yaxiong

Chen, Ran (University of Arizona) and Yue Wu (University of Science and Technology of China)
[36]

Beyond Projectiles: Experimental Study of Microblades as Cutting Tools

The miniaturization of lithic artifacts indicates a significant shift in lithic technology and functions since the Upper Paleolithic, revealing a probable shift in subsistence strategy. Microblades are specific kinds of small stone tools that occur in sites dating back to the Upper Paleolithic through Neolithic in many parts of the world. Although it is widely recognized that microblades were used as multi-functional tools, most experimental studies are focused on microblades as part of a composite tool system for use as projectiles or spears. A non-projectile perspective is applied in this study of chert microblades as cutting tools. Different plant and animal materials with different levels of hardness were processed experimentally to reveal specific use-wear patterns from cutting and scraping. A multi-stage sequential analysis using both low-power and high-power observation methods examined the appearance of different stages of use-wear. The results show that using microblade as knives can produce different diagnostic use-wear from different tasks in comparison to typical projectile features. This experiment provides new perspectives and generates new data to understand the function of microblades on plant and animal materials.

Chen, Xinzhou

[77]

Excavation and Archaeological Survey on Ancient Tibet Pastoralism: A Proposal and Pilot Studies

The Tibetan plateau hosts the world's largest pastoral ecosystem yet the archaeology of pastoralism remained understudied. Most of the excavations focused in the lowland areas of the river valleys while the highland plateau region was virtually ignored. Based on pilot archaeological survey and excavation in 2018 and 2019 in the central Tibetan plateau, I argue that the highland sector of ancient agro-pastoralism is significant in understanding landscape transformation of land through millennia. With a combination of ethnoarchaeology, GIS technique and geoarchaeology, highland landscape features are recoverable and distinguishable archaeologically, among which the pastoral corrals are most possible to be discovered in large quantities.

Chenault, Mark

[79]

Stone Palettes and the Founding Lineage of Pueblo Grande

Archaeologists believe that stone palettes had a ritual function in Hohokam society. Most of the palettes from the village site of Pueblo Grande were recovered from the central precinct. Very few palettes have been recovered from elsewhere at the site, including from the extensive excavations for the Hohokam Expressway project. This suggests that palettes were strongly associated with activities in the central precinct, which included a plaza, a ball court, and a large platform mound. In addition, most of the palettes found with cremation burials came from a single cemetery located directly west of the platform mound. The location of the cemetery in the main plaza suggests that it served as the burial ground of a corporate group with ties to the central precinct, possibly representing the founding lineage of Pueblo Grande. Palettes may have been a symbol of that lineage. Although the cremations predate the final Civano phase platform mound, the founding lineage probably was involved with the earliest stages of mound construction during the late Sacaton and Soho phases.

Chenault, Mark [71] see Mitchell, Douglas

Chenault, Mark [79] see Ryden, Ronald

Cheng, Wen Yin (University of Toronto) and Chen Shen (Royal Ontario Museum)**[94]***Traces of the Bronze Casting Artisans at the Royal Ontario Museum: Analyzing the Bronze Casting Molds*

Studying the production method of an artifact is similar to being an apprentice, by observing the master's final work we can understand their choices in making these artifacts. The detailed analysis of the bronze casting molds at the Royal Ontario Museum gave me the impression of learning from the ancient bronze casting masters through their work. Although no instructions are given, we can still see their knowledge and choices made through the marks that these artisans have left behind. By discussing the artisans who made the bronze casting molds, this research will bridge the detailed analysis of the bronze casting molds by discussing the results in relation to the artisan's knowledge and culture.

[94]*Chair*

Cheong, Kong [28] see Macrae, Scott

Cherkinsky, Alexander [231] see Napora, Katharine

Chesson, Meredith [35] see Berumen, Sara

Chávez, Estrella [29] see Thompson, Amy

Chiac, Virginia [178] see Longstaffe, Matthew

Chicoine, David (Louisiana State University)**[54]***Discussant***Chicoine, David (Louisiana State University), George Lau (University of East Anglia) and Jacob Bongers (University of East Anglia)****[174]***Post-Chavín Political Developments in Ancash: Comparative Perspectives from the Nepeña and Pallasca Regions*

In this paper, we present preliminary results of our 2019 excavations at the centers of Cerro San Isidro (Nepeña) and Pashash (Pallasca) in the Moro and Cabana regions of north-central Peru, respectively. Both are multi-component hilltop sites that developed into major post-Chavín elite centers, and witnessed a series of later occupations. Data on occupational sequences, fortifications, ceremonial architecture, offering contexts, and material culture are presented to shed comparative light on post-Chavín political developments in two neighboring regions that witnessed apparently quite different trajectories following the demise of the Chavín phenomenon. We focus on materialities of post-Chavín developments and their impact on the rise of new forms of political authority, including the strategic reuse, manipulation and ritual engagement with abandoned places, buildings and things. The comparison helps frame new understandings of about the proliferation of divine lordships in Ancash and the central Andes more broadly.

Chicoine, David [233] see Fenton, Monica

Chicoine, David [182] see Sutherland, Kenneth

Chiffi, Maria (Techné s.a.s.), Francesco Gabellone (National Research Council - CNR), Angela Ciancio (MiBAC, Polo Museale della Puglia) and Luigi La Rocca (MiBAC, Soprintendenza Archeologia, Belle Arti e Pa)**[104]***3D Digital Imaging solutions for Global Enjoyment of Mount Sannace Archaeological Park (Bari, Italy)*

Works related to the recovery and enhancement of Mount Sannace's Archaeological Park in the municipality of Gioia del Colle (Bari) began in 2016. Digital media products have been created on purpose with a strong communicative and technological connotation in order to connect cultural contents in a concise and attractive form. The reconstructive work is achieved by the combined studies of different survey systems that, alongside the classical ones, include remote sensing, photogrammetric survey, 3D analysis of architectural structures and their contextualization in their historical reference period. In particular, the archaeological documentation has been reviewed in the light of a re-reading of the information related to the integrated survey and the various possibilities offered by the 3D environment. The result of all this shows a new and more careful reconstruction of the appearance of the inhabited area, highlighting the various historical phases. From the technical point of view the results of this work underline the communicative effectiveness of the virtual restoration, which proposes a re-reading of the original appearance of monumental tombs. The entire village was reconstructed using historical information and archaeological evidence. Many reconstructions constitute an original contribution to the knowledge of the indigenous civilizations of southern Italy.

Chiffi, Maria [104] see Gabellone, Francesco

Childress, William [180] see Gingerich, Joseph A. M.

Childs, S. Terry (Retired, Department of the Interior)**[172]***Discussant*

Childs, S. Terry [132] see Farmer, Andrea

Chilton, Elizabeth (UMass Amherst)**[13]***Social Networking in New England Archaeology*

The basis of a lot of Brian's work and his conversations and debates with colleagues focused on aspects of social networking. Brian presented an important paper to CNEA several years ago in which he outlined the possible social mechanisms for the initial human colonization of the Northeast. Likely, he applied a social networking analysis to try to understand the social and political differences between Iroquoian and Algonquian-speaking peoples in the Northeast during the Late Woodland Period, and how those differences affected their respective experiences during European colonization. In this paper I outline both of these case studies and discuss how Brian's work and perspectives can inform how we address significant questions in New England archaeology in the future.

[13]*Chair*

Chinique de Armas, Yadira [173] see Naegele, Kathrin

Chiodini, Thomas [184] see Wescott, Konnie

Chiou, Katherine (University of Alabama)**[61]***Rich Food, Poor Food / Feast or Famine: Contextualizing Peasant Foodways in the Andean Past*

The "low" foods and dishes associated with peasant cookery are the products of generations of creativity and resourcefulness in the face of—at times—grim realities. In this presentation, I approach the theme of low cuisine from an Andean perspective by visiting an archaeological case study involving the Moche people of the desert north coast of Peru. The Moche, a highly complex and stratified political group, experienced societal decline and social unrest in the Late Moche period (AD 600–800) which was punctuated by several episodes of severe drought that likely impacted local foodways. During these tense times, fortified hillside/hilltop settlements with an emphasis on security like the site of Cerro Chapén in the Jequetepeque Valley were hastily constructed near prime agricultural land. Given the evidence for social stress and the existence of neighborhoods grouped across socioeconomic status, Cerro Chapén provides an opportunity to probe the impact of social, environmental, and political upheaval on daily life. By combining spatial analyses of commoner living spaces with the study of food remains, I highlight the humble ingredients that Moche commoners ate and the practices that past people in the region adopted to put food on the table in lean times.

Chiou, Katherine (University of Alabama)**[91]***Discussant*

Chiou, Katherine [147] see Hatcher, Lawford

Chiou, Katherine [241] see McKenzie, Emily

Chiriboga, Carlos [269] see Acuña, Mary Jane

Chirinos Ogata, Patricia [106] see Toohey, Jason

Chisholm, Amelia (The Lost Towns Project) and Julie Markin (Washington College)**[184]***Heritage in Crisis: Cultural Resources Vulnerability in the Jug Bay Wetlands, MD*

Current changes in the climate are impacting the cultural resources of the Chesapeake Bay region. Along the Jug Bay stretch of Maryland's Patuxent River, significant erosion of features and artifact degradation are due to a greater frequency of extreme high tide episodes in conjunction with a higher water table, increased groundwater salinity, and increased rainfall-induced surface runoff. Rich in natural resources, the area has seen continuous Native American activity over the past 13,000 years as the environment changed from riverine to estuarine following the end of the last Ice Age. Documented archaeological sites in Jug Bay range from base camps to resource procurement camps to ritual areas. Working in partnership, county, non-profit, and academic archaeologists and institutions are investigating the cultural resources of Jug Bay while they are still accessible. With a shoreline erosion rate of eight feet per year [1993–2010] along portions of Jug Bay, documenting new archaeological sites and assessing the condition of known sites is critical. Through survey, excavation, and the creation of a GIS database of sites, this interdisciplinary team is not merely creating an inventory of threatened cultural resources but is developing a more robust picture of the history of this area.

Chmura, Matthew [124] see Langlie, BrieAnna

Chovanec, Zuzana (Institute of Archaeology, Slovak Academy of Sciences)**[235]***From Poppies in the Field to Slumbering Dreams: The Ancient History of the Opium Poppy in Central Europe*

The paper presents the results of research on the history of the opium poppy (*Papaver somniferum* L.) in Central Europe from the Neolithic to Medieval period while serving as a U.S. Fulbright Scholar in Slovakia in 2018. The opium poppy represents one of the most widely used psychoactive and medicinal substances in human history. The fact that it is a significant agricultural resource, has a complex botanical history, and its small physical remains complicates the archaeological investigation of its use. Building on previous research in the eastern Mediterranean, the complex relationship between the opium poppy and humans is reexamined in light of new evidence from Slovakia and Central Europe.

Christenson, Allen**[138]***Places of Emergence: Water and Cave Ceremonialism in the Tz'utujil Region*

Throughout the highlands of Guatemala, Maya traditionalists believe that mountains and their associated cave openings are the "mouths of the world" giving access to spiritual realms inhabited by sacred beings that have influence over natural phenomena of importance to the outside world. Each of these caves or watery portals is a world center. Each may be just as powerful as a place of emergence or the birthplace of clouds, rain, germination of seeds, etc. It is the ritual actions that take place there that make it life-engendering, not its physical location. Thus each cave is the central axis point of the world because it leads to the place where revered ancestors, saints and deities live. The Maya perceive time as cyclic, and believe that at regular intervals the world must be ceremonially re-born to continue. Nearly all major highland Maya ceremonies deal with creation and rebirth in one way or another. It is this periodic renewal that allows life itself to continue. If these rituals are not performed in the proper way and under the proper circumstances, the Maya believe that they and all creation would simply slip back into primordial darkness, chaos and perpetual death.

Christie, Jessica (East Carolina University)**[200]***Walled Rock Wak'as on Inka Royal Estates in the Heartland*

This paper analyzes integration of local groups at two royal estates. Tipon began as a Killke settlement before 1400. Surrounded by an enormous defensive wall, it functioned as an outpost in the buffer zone between the Muyna and Pinagua in the Lucre Basin and the growing Cusco polity. Wiraqocha Inka led the final conquest of the region and turned Tipon into his royal estate. Písaq was developed into a royal estate by Pachakuti on land annexed from the Cuyo. Both estates exhibit a walled-in outcrop near Cusco-style architecture and canal systems. The discussion compares and contrasts the settings of the estates and rock wak'as, framing the latter as repeated markers of Inka state authority. Andean settlements, *llacta*, grew from the union of a localized wak'a with its territory and the people this wak'a favored. The Inka seized local wak'as and often repositioned them as active agents of the state near architectural spaces where ideological performances occurred to impose a new imperial order. The physical differences between the outcrops (unmodified versus sculpted) suggest that whereas the new order of the Inka state was taxonomic and essentialized, it allowed flexibility in how to materialize it in diverse case scenarios.

Chu, Alejandro**[224]***Negotiated Economies: Staple and Wealth Storage Facilities at Incahuasi, Cañete*

Research at the Inka site of Incahuasi located in the mid valley of the Cañete River, south central coast of Peru has identified two large storage complexes (sectors A and E) that reflects staple and wealth finance as defined by Earle and D'Altroy (1985). The architectonic configuration of the two facilities, its access and the remains recovered from excavations confirm our assumptions. This is the first time these two types of finance reflected in storage facilities are reported from an Inka site. As the Inkas occupied the mid valley they transformed its landscape into an important production center of staples (maize, chili peppers) and of the valued coastal coca (*Erythroxylum novogranatense*). Other wealth products found at the storage facilities include fine textiles (*cumbi*) and pieces of *Spondylus*. This paper will present the available data and discuss the role local population and their elites had in the management of the site.

Chu, Wei, Adrian Dobos (Romanian Academy of Sciences), João Marreiros (Archaeological Research Centre and Museum for Huma), Alex Ciornei (Romanian Academy of Sciences) and Jürgen Richter (University of Cologne)**[162]***A High-Resolution Investigation of the Middle-Upper Paleolithic Transition at Românești-Dumbrăvița I (Banat, Romania)*

This paper outlines the results of the 2016–2019 field seasons at Românești-Dumbrăvița I, a key Paleolithic open-air site preserved in loess-like sediments in Western Romania at the fringes of the Carpathian Arc. The excavation aimed to refine the resolution of previous excavations by clarifying our understanding of the Middle-Upper Paleolithic transition in a region that is home to some of the earliest (hybridized) modern human remains and Proto-Aurignacian assemblages in Europe. Here we present the results of fine-grained spatial analysis, geochemistry, micromorphology, lithic raw material proveniencing and trace wear studies. The results strengthen our understanding of the site formation processes and site function. This, combined with previous excavations that focused on lithic typology and chronology, provides us with valuable context of the early modern humans in the region. We also place this site and its associated artifacts within the contemporary framework of Central Eastern Europe and the larger Middle to Upper Paleolithic context of Europe.

Chuenwattana, Nattha (University of Toronto)**[228]***Doing Paleoethnobotany in Thailand: Perception of the Thai Archaeologists and the General Public*

Palaeoethnobotany is a new data collecting and interpretive discipline for Thai archaeologists. Archaeology is classified as a arts/humanity in Thailand, without fundamental scientific knowledge. This is due to the lack of teaching archaeological science as a social science in archaeological institutions. This paper will focus on the development of archaeological science in Thailand, with the emphasis on palaeoethnobotany, and the current perceptions of the Thai general public in both archaeological science and palaeoethnobotany.

Chuluun, Sampildonov [62] see Piezonka, Henny

Church, Warren (Columbus State University, GA)**[106]***Wari Expansion into Peru's Northeastern Andes: New Evidence and New Questions*

Unlike most of the northern Peruvian "culture areas" represented in this session, archaeologists of the twentieth century only rarely interpreted prehispanic cultural development in Peru's northeastern Andean "Chachapoyas area" in terms of internal dynamics. In the Chachapoyas region's dense montane rain forests, dominant narratives cited externally forced migratory processes originating in surrounding highland or lowland regions to account for the emergence of Chachapoyas cultural traditions after AD 800. By the 1990s, excavated stratified sequences revealing long-term cultural development in the region could no longer be dismissed. With intensified regional research, Early Intermediate Period sites are now frequently identified. But by AD 600, radiocarbon-dated remains that might represent regional Middle Horizon occupations have been rare or absent, and sequences seem to resume ca. AD 1000. Scattered finds of Cajamarca Cursive-floral style, and Wari imperial-style sherds puzzled scholars until 2017 when a site with diagnostic features of a Wari provincial enclave was identified in the Uchucmarca valley, strategically located in the center of the Chachapoyas region. My colleagues and I now explore new questions that speak to 1) Chachapoyas cultural development, and 2) Wari expansion into the northeastern Andean regions presumed to facilitate or monopolize access to lowland Amazonian societies.

Ciancio, Angela [104] see Chiffi, Maria

Cinquino, Michael [60] see Hayward, Michele

Ciolek-Torello, Richard [247] see Grenda, Robert

Ciornei, Alex [162] see Chu, Wei

Ciugudean, Horia [35] see Langston, Jada

Clark, Alexis [189] see Vidal-Guzmán, Cuauhtémoc

Clark, Amy (Harvard University)**[180]***Quarries, Workshops, or Campsites? How Are We to Understand the Wealth of Raw Material at Open Air Neanderthal Sites in France*

France is replete with open air Middle Paleolithic sites that are characterized by dense accumulations of lithic debris. Some of these sites are situated on top of raw material sources, while others are a short distance away. Transport costs were therefore minimal, but not negligible. The percentages of tools within these assemblages are very low and a high number of large flakes were left unutilized. However, some flakes do exhibit use wear and lithic pieces were moved around the sites in such a way to suggest that they were made and used on site. Should these sites therefore be considered quarries, workshops, or campsites? Is this type of categorization even useful? And furthermore, how are we to understand these sites in light of various models regarding stone tool economy and hunter-gatherer behavior? On this poster I will display Middle Paleolithic data from France alongside comparative examples from different regions and time periods. I hope that the data presented, and the questions proposed, will generate discussion with conference attendees and will encourage comparison with other research areas.

[180]*Chair***Clark, Bonnie (University of Denver)****[46]***It's Not about the Past*

If there is one thing that non-archaeologists know about what we do, it is that we care about old things. That is why random people on airplanes ask us about dinosaurs. But in actuality, archaeology is just as much about the present as the past. It will always be shaped by present-day concerns and be pursued by present-day people. Rather than wring our hands about some

supposed loss of scientific purity, we can embrace this fact to accomplish two important goals. First, admitting our contemporaneity can translate into addressing questions that count in the here and now. That might involve looking to the past for clues about sustainability or reactions to changing climate. But it also can mean using the spotlight of archaeology to fight for social justice. Second, being anchored in the present helps us focus not just on our findings but also on our process: how we get there and with whom. People care about our research and we need to think about ways to productively include them in our work. That often involves collaborating in different ways, from input on research design, to working together in the field, to opening up interpretation.

Clark, Bonnie [112] see Corbett, Kathleen

Clark, Bonnie [6] see Gilmore, Kevin

Clark, Caven (National Clark Service)

[92]

Discussant

Clark, Geoffrey [100] see Napolitano, Matthew

Clark, Jeffery (Archaeology Southwest)

[122]

Chair

Clark, Jeffrey [142] see Smith, Jaye

Clark, Jessica (Ohio Valley Archaeology Inc.) and Kirstyn Leque (Ohio Valley Archaeology Inc.)

[213]

A Tale of Two Homesteads: A Comparative Look at Forest Meeker Residential Sites

Forest Meeker was one of the early nineteenth century founders of the mill town of Stratford in central Ohio's Delaware County. Prior to serving in the War of 1812, he and his family lived in a cabin, c.1811, until he constructed a formal brick residence nearby in 1823. Excavations at both a cabin site on Meeker's former property and the c.1823 Forest Meeker homestead have yielded contextually distinct artifact assemblages. This poster presents side-by-side assemblage comparisons that demonstrate what we interpret to be temporally distinct but consecutive occupations.

Clark, Julia [62] see Taylor, William

Clark, Kate (University of Suffolk)

[221]

"Playing with the Past": Using Creative Activities to Teach Skills in Heritage Practice

I received a traditional archaeological education—some theory and a solid grounding in one period (the palaeolithic). Since then my career has taken me via industrial archaeology into museums and heritage of all types and periods. But no-one taught me the skills I would actually need—such as project management and evaluation, community engagement, site interpretation, strategic planning, decision-making, negotiation and mediation. How to work with architects, engineers, planners and educators s- most of whom didn't 'get' archaeology! And the listening skills, empathy and compassion needed to work with people whose culture, values and ideas of heritage were very different to my own. These were not things you could learn in a lecture room. Inspired by the activities and games used by actors and teachers, I created "Playing with the Past"—a book of over 80 different activities designed to teach skills in heritage practice, from community engagement to leadership. Designed to 'Train the Trainers' it can be used with communities, students and professional groups, across any kind of cultural resources—from archaeology to buildings and beyond.

Clark, Terence (University of Saskatchewan)

[239]

Archaeology in an Era of Reconciliation: Insights from the Front Line

In Canada, the Truth and Reconciliation Commission Calls to Action laid out a new framework for settlers to engage with Indigenous Peoples. These calls do have significant impact on the field of archaeology as they acknowledge a colonial past and seek to reset the archaeologist/descendant community power balance in the future. The Archaeology of Reconciliation is a nascent field; however, the first projects are now underway. This paper will define Archaeology of Reconciliation and discuss some examples of the theory in action. Although focused on the Canadian context, more broadly, this theory can apply to descendant communities having control over academic research on their past elsewhere.

[239]

Chair

Clarke, Mary (Boston University)

[20]

Producing Stone and the State: The Socioeconomic Organization of Limestone Production at the Ancient Maya Site of Xultun, Guatemala

Limestone is a ubiquitous material in Mesoamerica that was used by the ancient Maya for a myriad of purposes, including the construction of monumental art and architecture. At the site of Xultun, Guatemala, a stone production district was identified wherein domestic architecture is integrated with quarry workshops. The quarries in this district contain incomplete monuments still attached to the limestone bedrock as well as exhausted quarry islands and surfaces reused as platforms for residential architecture. The limestone producers living in this district were specifically producing materials for monumental state expressions, implying a single consumer, the state. Using this district as a case study, this paper will address the systems of exchange visible in household consumption patterns and evaluate the extent of state involvement in the production and distribution of local limestone resources.

[20]

Chair

Clarke, Mary [20] see Paling, Jason

Claypatch, Hunter [79] see McGuire, Randall

Clayton, Sarah (University of Wisconsin-Madison)

[133]

Everyday Life at Chicoloapan, Mexico: Tracing the Formation of a Post-collapse Community

The Epiclassic period (550–850 CE) in central Mexico is widely viewed by archaeologists as a time of instability, violent conflict, and large-scale migration. The collapse of Teotihuacan left a fractious and decentralized sociopolitical landscape in its wake—a situation that contrasted starkly with the consolidated macroregional system that the state had dominated. However, this time of crisis was also marked by resilience and innovation as people reconfigured social and economic networks, adopted novel practices and institutions, created new communities and implemented new approaches to land-use and urban planning. Here, I consider these changes from the perspective of Chicoloapan, a settlement in the southern Basin of Mexico that prospered as Teotihuacan declined. By the mid 600s, Chicoloapan had grown from a small village to a sprawling town of several thousand people. Long-term research at Chicoloapan combines excavation, remote sensing, and paleoenvironmental reconstruction to examine the local process of community formation under conditions of broader regional instability. Drawing from these diverse lines of evidence, I discuss the timing of Chicoloapan's growth, the everyday practices of households, and the ways in which residents modified the built environment to establish new forms of local leadership and community interaction.

[133]

Chair

Clayton, Sarah [133] see Barba, Luis

Clayton, Sarah [133] see Freiwald, Carolyn

Cleghorn, Naomi [38] see Keller, Hannah

Cleland, Timothy [180] see Gingerich, Joseph A. M.

Cleveland, Mitchell [148] see Patton, Natalie

Clifton, Julia [172] see McBrinn, Maxine

Clindaniel, Jon (University of Chicago)

[200]

Alternative Khipu Codes: Responses to Inka Imperialism through the Production of Khipu Signs

In this talk, I suggest that Inka khipus were sites of imperial negotiation in addition to their role as recording devices for Inka administrators. Inka khipus exhibited high levels of codified semiotic homogeneity, such that they could be interpreted throughout the Inka Empire. However, I present evidence that there were also geographic pockets where khipu-makers used standard, hegemonic Inka khipu codes in conjunction with local, subaltern khipu codes that subverted the meanings of certain standard Inka khipu signs. Over the course of the presentation, I explore the political geography of khipu signs in more detail and investigate how and why these local codes may have been used in conjunction with dominant Inka codes as local responses to Inka imperialism.

Clindaniel, Jon [164] see Splitstoser, Jeffrey

Cloud, Andy [40] see Walter, Richard

Cloud, William

[101]

Collaboration along the West Texas-Chihuahua/Coahuila Borderlands: A Memorandum of Understanding between the Center for Big Bend Studies and Mexico's Instituto Nacional de Antropología e Historia

In July 2017, the Center for Big Bend Studies (CBBS) of Sul Ross State University and the Instituto Nacional de Antropología e

Historia (INAH)—the federal agency that oversees all anthropological and historical sites in Mexico—signed a Memorandum of Understanding (MOU) to promote cooperation and collaboration on borderland and other projects of mutual interest. Guided by similar missions and goals, the two organizations have made progress in their respective studies along the West Texas-Chihuahua/Coahuila border, but each has been limited by a lack of access to sites and/or to data from the other side of the Rio Grande/Rio Bravo del Norte. Subsequent to the MOU signing, the CBBS and INAH have supported one another at conferences and events on both sides of the river, exchanged a wide range of data, and are cooperating on mutual avenues of research, such as obsidian sourcing. This presentation provides an overview of the agreement and delves into a variety of future collaborations under consideration, including excavations at select sites of significance on each side of the river.

Clymer, Mark [190] see Lothrop, Jonathan

Cobb, Charles [123] see Sorresso, Dominique

Cobb, Peter

[205]

Sometimes at the Crossroads: Preliminary Results from New Fieldwork on the Southeast Ararat Plain of Armenia

The Ararat Plain, part of the upper Araxes River valley system in the South Caucasus Mountains, represents the largest expanse of arable land in Armenia today. At the southeastern edge of this plain, the Vedi River valley, a tributary to the Araxes, connects the agricultural zones of the plain with the resource-rich mountains and Lake Sevan to the east. The summer of 2019 saw the initiation of a new landscape-oriented research project to investigate past life and mobility through this valley, particularly in the Bronze and Iron Ages. Extensive survey and test excavations identified and characterized multiple new sites. The primary focus of the season was the start of excavations at a high fortified site with a commanding view of the valley, called the Vedi Fortress. This multi-period site holds promise to enhance our knowledge of the pre- and proto-historic phases of this part of Armenia. Our project interrogates the militaristic landscapes of the Late Bronze and Iron ages and compares the deployment of the same spaces during the medieval period. This born-digital project deploys 3d capture of contexts and objects with the goal of enabling comprehensive digital analysis of complete excavation datasets.

Cobos, Rafael (Universidad Autónoma de Yucatán)

[126]

The Study of Chichen Itza's Fine-Orange: Ron Bishop and His Contributions to Northern Maya Lowlands Archaeology

Ronald Bishop's involvement in Yucatán's archaeology is evident by his participation in two specific activities developed over the past four decades. First, his research focused on the analysis of Fine-orange Silho group ceramics, which were a trademark of Chichen Itza and its coastal ports before and during its apogee. Second, his training of a new generation of scholars at the University of Yucatán (Merida), and equipping the ceramic laboratory at this university with various special microscopes. Bishop's pioneering view where he combines well trained human scholars with microscopic equipment, clearly shows his legacy in a growing field where ceramics studies play a crucial role in understanding local versus non-local production, distribution patterns related to economic factors as well as the consumption habits of a wide-range of individuals who inhabited the northern Maya lowlands.

Cocco, Gabriel [196] see Thompson, Helen

Cochran, Lindsey (University of Georgia), Victor Thompson (University of Georgia) and Bryan Tucker (Georgia Department of Natural Resources)

[140]

Creating Living Predictive Models of Georgia's Coastal Paleo-Environmental Landscapes

While we brace ourselves for climate related threats to archaeological sites in Georgia, USA, a priority is to create a triage system to determine how and which cultural resources to document, preserve, and protect. The breadth of environmental profiles among the Sea Islands present a unique set of opportunities to generate computerized models of multi-temporal and multi-cultural landscapes revolving around human occupation and manipulation of barrier islands, back-barrier islands, and estuaries. Predictive modeling of paleo-landscapes is predicated on the use of quality environmental raster data, however integrating paleo-environmental data with modern imagery presents new challenges that will be addressed in this discussion. In this paper, we integrate the breadth of Georgia's coastal culture history with the complex task of describing how past peoples have interacted with landscape changes over time, thus simultaneously shaping and being shaped by the world around them, by using geospatial and statistically informed models.

Cochrane, Ethan [100] see Rieth, Timothy

Cockrell, Brett [186] see Franklin, Stephanie

Coco, Emily (New York University), Simon Holdaway (University of Auckland) and Radu Iovita (New York University)

[162]

Technological Evolution Is Unnecessary for the Formation of "Transitional" Industries

Some stone tool kits show a mixture of characteristics from the preceding Middle Paleolithic period and the subsequent Upper

Paleolithic period. These industries are called “transitional” to describe their status as acculturation phenomena between Middle and Upper Paleolithic populations, or as resulting from independent evolution of Middle Paleolithic tool kits into Upper Paleolithic tool kits. These explanations are problematic due to the underlying assumption of superiority of Upper Paleolithic technologies and because these transitions happen slowly in the archaeological record. This paper seeks alternative explanations for “transitional” industries, specifically addressing the possibility that these assemblages formed as a result of lithic scavenging behaviors of two technologically-divergent populations. We demonstrate that sites resembling transitional sites are produced by simple recycling behaviors without overlap between two populations or technological evolution. Our results challenge the assumptions that the formation of transitional industries requires interaction and/or technological evolution. Instead, “transitional” sites can occur if Upper Paleolithic populations recycled Middle Paleolithic artifacts. The results of this study demonstrate the need to reevaluate the way we interpret assemblages of mixed technological features during the Middle-Upper Paleolithic transition. Specifically, we need to redefine what constitutes a technological transition and how that can be inferred from the archaeological record.

Codding, Brian (University of Utah), David Zeanah (Sacramento State University), Rebecca Bliege Bird (Penn State) and Douglas Bird (Penn State)

[15]

Resource Acquisition Risk as a Driver of Subsistence Transitions

Explaining major subsistence transitions in human prehistory requires an evaluation of the costs and benefits that past people experienced. All too often, these trade-offs are explored solely by analysis of central tendency (i.e., mean returns), without exploring the distribution of possible outcomes. Here we explore how acquisition risk, or variance in expected returns, is an equally (if not more) important factor to consider when examining past and present subsistence transitions. We model this using quantitative ethnographic data and simulated archaeological proxies to evaluate the role of resource acquisition risk as a driver of past subsistence transitions.

Codding, Brian [236] see James, L. Brock

Codding, Brian [195] see Vernon, Kenneth

Codding, Brian [61] see Wilson, Kurt

Codlin, Maria (Boston University)

[76]

Animal Acquisition at Teotihuacan

Animal husbandry and other forms of animal management were an important part of the economy in ancient urban centers. At the Mesoamerican metropolis of Teotihuacan, multiple animal acquisition strategies were available to support the city which lacked large domesticated animals. While turkeys and dogs have a long history of domestic production in Mesoamerica, we lack clear evidence that dog and turkey husbandry was a major component of the Teotihuacan economy. Recently, researchers have suggested that the captive management of wild carnivorous animals and rabbits was an important component in supplying animals for state rituals and domestic consumption. This research presents initial findings from the analysis of faunal remains from Tlajinga and Tlailotlacan (the Oaxacan barrio), two ethnically distinct neighborhoods in the southern and western sectors of the city. The overall project aims to examine how animals were acquired by the city's residents over time, particularly the importance of animal management compared to hunting and trapping, as well as the importance of terrestrial species compared to lacustrine species.

Codlin, Maria [150] see Carballo, David

Cody, Mercedes (SWCA Environmental Consultants), Christina Nielsen (SWCA Environmental Consultants) and Steve Carpenter (SWCA Environmental Consultants)

[176]

Archaeological Investigations at the Llano Terrace Site (41MS78)

From February through March 2019, SWCA archaeologists and subcontractors from Hicks & Company and Integrated Environmental Solutions excavated portions of the Llano Terrace Site (41MS78) exposed in roadcuts along the east and western sides of the existing Ranch-to-Market (RM) 1871 roadway in Mason County, Texas. The site lies on the western terraces of the Llano River and consists of a prehistoric campsite with stratified cultural deposits spanning the Early to Late Archaic (8800–2000 BP). In addition, two earlier components may be present at the site and are tentatively identified as Paleoindian based on the recovery of a lanceolate point. Cultural features at the site include a heavily sheered burned rock midden deposit and nine other burned rock features; the features represent hearths, ovens, and other cooking features. A light scatter of debitage was consistently associated with the features but formal tools were uncommon. Although organic preservation at the site is low and the cultural component assemblages are not diverse, the site appears to have reasonably good stratigraphic integrity and the potential for isolable components. This poster highlights the variety of cultural features encountered at 41MS78 as well as preliminary results of ongoing associated analyses and interpretations.

Coe, Marion (Center for the Study of the First Americans, Texas A&M University)

[148]

Cordage and Coiled Basketry as Indicators of Site Function and Social Identity in the Bonneville Basin

Perishable artifacts are well-preserved and long-lived in the Great Basin and are suited for studies of subsistence and social interaction, including economic and marriage networks, migration, population movement, and identity. This study of cordage and coiled basketry from 10 late Holocene-aged dry caves and rockshelters in the Bonneville Basin applies a behavioral interpretive approach with analytical methods focused on reconstructing technological organization and operational sequence to characterize the nature of variation between sites within this artifact class. A comparison of sites in the Bonneville Basin suggests distinct

variation in site use reflected in the potential function of finished cordage and basketry at the sites; however, technological stylistic traits associated with manufacturing process and potentially the social identity of the manufacturer potentially show separate relationships between sites within this material class. This study demonstrates the potential of this method to illustrate the nature of previously identified changes in demographics in the Bonneville Basin and more subtle and multiscalar social interactions of gender and the community, as well as adding further support for the value of reanalyzing curated museum collections.

Coffey, Grant [26] see Robinson, Erick
Coffey, Grant [147] see Schwindt, Dylan
Coffey, Grant [147] see Varien, Mark

Coffman, Sam [82] see Reuther, Joshua

Cojti-Ren, Iyaxel (Vanderbilt University)
[151]

Postwar archaeology in the highlands of Guatemala

What do we know about the social and political context of the populations that live adjacent to archaeological sites? How is the relationship between a local population and archaeological sites? These are some essential questions that we must answer before planning and conducting an archaeological project. In many cases, what we know is part of a more complex context that possibly we will better understand during our research fieldwork and new actors come into play. In this presentation, I discuss the need to create a typology of archaeological sites in the Guatemala highlands. We need to determine which places are safe to coordinate research projects with local populations and which others have complex contexts. Based on my fieldwork experience in Chichicastenango, K'iche', I argue that many individuals and paramilitary groups that served in the army during the 80's are still active and holding leadership positions. Today, this leadership is exercised with new identities. These groups continue to reproduce the ideology of "the internal enemy" to deter any initiative that threatens their interests. Under these circumstances, it is necessary to question the feasibility of archaeological investigations and think alternative strategies to promote valorization and conservation of our cultural heritage.

Coleman, Wendi [50] see Turley, Cameron

Collard, Mark [236] see O'Brien, Michael

Collins, Benjamin (University of Manitoba), Ayanda Mdludlu (University of Cape Town), Jayne Wilkins (Griffith University), April Nowell (University of Victoria) and Christopher Ames (University of Wollongong)
[11]

Evolving Social Networks during the Late Pleistocene: The Perspective from Grassridge Rockshelter, South Africa

Humans are social beings and being able to track social interactions and relationships across space and through time is a major focus of both anthropological and archaeological research. Within archaeology, the scale and intensity of social interactions has been related to the pace of cultural and technological innovations, which in turn produces a major influence on mobility, material culture, and a multitude of other cultural facets in past societies. This paper will present data from the lithic and personal ornament (marine and ostrich eggshell bead) assemblages recovered from the Late Pleistocene archaeological record (~45,000–11,700 years ago) at Grassridge Rockshelter, Eastern Cape, to provide an interior grasslands perspective on the archaeology of this region during these time. Further, the data from Grassridge will be compared with other well-described sites in the broader area to discuss the extent or absence of social networks at a regional scale.

[11]
Chair

Collins, Ryan (Boston University)
[202]

Applying Ground Penetrating Radar (GPR) to Explore Urban Development in the Maya Area

This paper explores comparative early urban development by focusing on the methodological application of ground penetrating radar (GPR) to augment LiDAR data at the Northern Maya Lowland center of Yaxuná. By 900 BCE Yaxuná was characterized by a civic ceremonial center and a small (likely seasonal) occupation. In contrast to the contemporaneous center of Ceibal, in Guatemala, Yaxuná's earliest detected constructions are not the result of building up broad plateaus. Instead, they went down. Extensive ground-penetrating radar (GPR) survey and excavation revealed that Yaxuná's 100-meter-long and roughly 60-meter-wide Central Plaza was set in a cleared expanse of naturally flat bedrock 2 m in depth lower than the surrounding landscape. While excavation was critical to confirming the depression Yaxuná's core, its extent could not have been determined without GPR. Furthermore, the collected GPR data from Yaxuná augment the LiDAR of the civic core allowing for a more precise analysis of the site's early urban development. Like Ceibal, a plateau appears to have been constructed at Yaxuná but only by 400 BCE. While the construction of extensive plateaus is found at Ceibal and Yaxuná at different times, their presence may be suggestive of formalizing practices for civic development.

Coltman, Jeremy (University of California, Riverside), Karl Taube (University of California, Riverside) and Travis Stanton (University of California, Riverside)
[225]

Blood on the Stones: Heart Sacrifice and Sacrificial Stone Altars in the Northern Maya Lowlands

Heart sacrifice constituted one of the most basic yet fundamental tenets of Mesoamerican ritual practice. At Early Postclassic Chichen Itza, as with the later Aztec of Tenochtitlan, hearts and blood were offered to the bellicose Solar deity whose daily journey through the sky not only depended on but also demanded such offerings. Heart sacrifice was also a creative act that invoked concepts of the world directions, centrality, and cosmic renewal. This paper will explore heart sacrifice and sacrificial altars in the Northern Maya lowlands including the Puuc region where drum and column altars were often placed at the base of temples. Architectural and iconographic evidence will be presented for these being altars used for heart sacrifice, both in terms of where they appear and what is depicted on them. Scenes of similar altars used in heart sacrifice will also be presented.

Coltofean-Arizancu, Laura (University of Barcelona, Spain), Tommaso Mattioli (University of Barcelona, Spain), Gabriel García Atiénzar (University of Alicante, Spain), Virginia Barciela (University of Alicante, Spain) and Margarita Díaz-Andreu (ICREA and University of Barcelona, Spain)
[25]

Rock Art and GIS: Bridging the Gap between Audibility, Visibility, and Landscape

This paper discusses the potential of GIS analyses in correlating rock art, landscape, and audibility. It does so by presenting a methodology that was applied in surveying a selection of rock art sites located in the Alicante Mountains, along the Mediterranean coast in the northern part of the Alicante Province in Spain. These sites are particularly interesting as they contain paintings created by the first Neolithic farmers (ca. 5600–5200 cal BC) in the so-called Macroschematic style. The paper begins with an introduction to Macroschematic art and the previous use of GIS in independently researching the visual and the audible in rock art studies. It then explains the methodology designed for exploring the importance of audibility and visibility for the perception of rock art landscapes around concepts such as acoustic effects, adjacent landscape, larger territorial scale, viewshed and soundshed directionality. The paper continues with describing the investigated rock art sites and the measurements performed at each place. Finally, it provides an extensive discussion on the obtained results and it concludes with new interpretations on how Macroschematic artists built their social and symbolic landscapes. The research undertaken for this work has been carried out within the ERC Artsoundscapes Project.

Coltofean-Arizancu, Laura [25] see Jiménez Pasalodos, Raquel

Coltrain, Joan [61] see Wilson, Kurt

Colvin, Matthew [166] see Heep, Nathan

Combey, Andy (Université Grenoble Alpes), Laurence Audin (ISTerre - IRD [France]), Carlos Benavente Escóbar (INGEMMET [Peru]), Miguel Rodríguez Pascua (Instituto Geológico y Minero de España) and José Bastante Abuhadba (Director of the Archaeological Park of Machu Picchu)
[197]

Inka Dry Ashlar Masonry, a Deliberate Seismic-Proof Architecture? Reassessment through an Archaeoseismological Approach in the Cuzco Area, Peru

For decades now, various scholars have assumed that the Inkas developed seismic-resistant construction techniques. While it is true that some architectural features are particularly well suited to face the seismic risk, no structural evidence can demonstrate with confidence the intentionality of the earthquake resistance. As part of our research, we discuss and evaluate the Inka's risk perception and management through an archaeoseismological-pioneering approach. Based on a field-tested methodology, our detailed survey intends to register architectural disorders caused by earthquakes on precolumbian sites of the Cuzco and Sacred Valley. Crossed by numerous active faults, the Cuzco region is subject to a strong seismic hazard. The dense human occupation for over 3,000 years thus makes archaeological remains valuable markers for paleo-seismicity characterization. Combined with other evidence of past seismic activity (fault trenching, lake coring and ethnohistorical sources) we aim to date prehistoric earthquakes and assess their induced social effects. In a similar manner to the 1650 and 1950 earthquakes that devastated the Cuzco city, our first results suggest the occurrence of an important seismic event during the Late Horizon (1400–1533 AD). By evidencing new paleo-events, our investigation is shedding a new light on the complex relation between Inkas and earthquakes.

Combs, Reece [104] see Kingsland, Kaitlyn

Comeau, Brad [236] see Brady, Ryan

Comeca Ramirez, Gianina (Université de Rennes / UNMSM / UNT), Gabriel Prieto (Universidad Nacional de Trujillo) and Pilar Babot (Universidad Nacional de Tucumán)
[174]

Scraping the Pots: Residue Analysis of Salinar Ceramic Vessels Found in Domestic Contexts at Pampa la Cruz, Huanchaco, North Coast of Peru

In this paper, we present preliminary results of organic residues analysis taken from ceramic vessels found in domestic contexts at the site of Pampa la Cruz, North Coast of Peru. This study emphasizes the importance of plant consumption among early fishermen

populations against traditional assumptions that cultivated crops were of minor significant to these communities. More important, it opens the possibility to explore the social and economic relationships between fishing and farming communities and even distant-trade during the late early Horizon or after the Chavin sphere of interaction collapse. Our results show that the use of ceramic vessels was linked to the consumption of several fruits, tubers and even *Theobroma* spp. "cacao" which is up to date, the earliest evidence of this species in the entire south Pacific Coast. The identification of damage due to processing modes (grounding, boiling, roasting, and fermenting) in the starches of these taxa indicates the that stages reported by ethnographic literature for the making of sophisticated fermented beverages like chicha were carried out at the site. This show the importance of activities associated with the production and consumption of fermented beverages among ancient fishing communities.

Commendador, Amy [236] see Kumm, Ethan
Commendador, Amy [177] see Tomich, Kassi

Compagno Zoan, Clara [198] see Franco, Nora

Comstock, Aaron (Ohio State University) and Benjamin Cross (Ohio State University)

[78]

Using Micromorphology to Examine Structure Use and Abandonment at an Early Fort Ancient Village in Southwest Ohio
Recent excavations at the Turpin site (33HA19), a multi-component Late Woodland and Fort Ancient settlement located in southwest Ohio, produced clear evidence of Mississippian connections. Three wall trench structures dated between AD 1030 and AD 1275, as well as numerous features that produced Mississippian-style shell tempered pottery suggest that Turpin may reflect a classic site-level intrusion of Mississippian agriculturalists. This project provides initial results of a micromorphological examination of key contexts from Turpin excavations. The microscopic examination of soil thin sections allows for the determination of natural and anthropogenic processes of pedogenesis through the identification of soil components. Here, we examine soil thin sections sampled from profiles in two structural basins associated with wall-trench structures that appear to have had different use histories. One structure was renovated and filled relatively rapidly while the other appears to have been filled with standing midden or left open and filled naturally. The results of this project serve to aid in our investigation of the transition to agriculture in the Middle Ohio Valley and our understanding of household use, reuse, and decommissioning at an early Fort Ancient village.

Comstock, Aaron [264] see Kooiman, Susan

Conard, Nicholas [11] see Matos, Daniela
Conard, Nicholas [36] see Oechsner, Amy
Conard, Nicholas [11] see Will, Manuel
Conard, Nicholas [162] see Wong, Gillian
Condon, Peter [68] see Holliday, Vance

Conger, Megan (University of Georgia)

[267]

Beads, Brass, and Jesuits: Quantitative and Qualitative Evidence for World-System Expansion in Northern Iroquoia
European-manufactured trade good data and ethnohistoric data are drawn together under a world-systems framework to explore how world-system expansion occurred in concert with localized processes of settlement relocation, conflict, and political consolidation in southern Ontario and southern Québec, Canada, ca. AD 1550–1650. Despite broad conceptualization as an interregional phenomenon, world-system expansion is heterogenous and dependent upon localized historical contingency and sociopolitical dispositions. I analyze the composition and distribution of European-manufactured trade good assemblages from 90+ Iroquoian sites (12,000+ artifacts) in Southern Ontario and Southern Québec dating to ca. AD 1550–1650. Using measures of assemblage diversity and equitability, I compare the variation present among assemblages at contemporaneous sites, and briefly consider the impact of new, absolute chronologies in determining contemporaneity among sites. Using the Jesuit Relations and other primary ethnohistoric literature as interpretive tools, I consider the range of interactions, including resistance, ambivalence, and negotiation, which Indigenous peoples in the study area were documented to have enacted during the earliest years of direct and indirect Indigenous-European contact. I conclude that European trade good assemblages varied among contemporaneous Iroquoian sites, and I suggest that this variation reflects different choices intentionally made by separate communities navigating and directing the process of world-system expansion.

Conger, Megan [12] see Birch, Jennifer

Conkey, Margaret (UC-Berkeley)

[56]

Discussant

Conkey, Margaret (UC-Berkeley)

[103]

Discussant

Conlee, Christina (Texas State University), Corina Kellner (Northern Arizona University), Chet Walker (Archaeo-Geophysical Associates LLC) and Aldo Noriega (Proyecto Huaca del Loro)

[21]

Huaca del Loro: A Wari Colony in Coastal Nasca

Excavations at the site of Huaca del Loro in the Las Trancas Valley of the Nasca drainage have uncovered a Wari settlement, a cemetery primarily for local individuals, and a large habitation area possibly for local support personnel. In the Wari sector, Ground Penetrating Radar (GPR) previously identified subsurface rectilinear architecture similar to that found at other Wari sites. Additional GPR survey revealed part of a large round structure. Excavations were focused in this sector to expose the architecture and it was determined that the rectilinear architecture is a Wari style compound, and that the round structure is a D-shaped temple (one of the first identified in coastal Peru). Material culture associated with the Wari architecture consists of local Loro ceramics, Wari style offerings, and limited amounts of Wari imperial ceramics. In the cemetery, a Nasca style "trophy" head individual was excavated from a looted multiple-individual tomb, suggesting local control over important cultural behavior. In the large habitation area, excavations uncovered quinchá (cane) architecture in the local style along with Loro ceramics, suggesting this area was occupied by local people although future excavations are necessary to assess the nature of this sector.

Conlee, Christina [243] see Berry, Nora

Conley, Daniel [53] see Trachman, Rissa

Conlin, David [273] see Lubkemann, Stephen

Conrad, Cyler (Los Alamos National Laboratory), Sandi Copeland (Los Alamos National Laboratory), Kari Cates (Independent Researcher), Mary Faith Flores (University of Oklahoma) and Brian Kemp (University of Oklahoma)

[129]

A Cultural Landscape of Birds: Archaeological, Ethnographic and Iconographic Insights into Long-Term, Human-Bird Interaction on the Pajarito Plateau

The name "Pajarito" Plateau, meaning "little bird" in Spanish, is symbolic not only because of the large diversity of birds present in this region of northern New Mexico but because of the archaeological evidence for long-term human-bird interaction in this cultural landscape. Significance of birds for the descendant communities of the Ancestral Pueblo peoples who live on the Plateau is clearly identified through oral histories and traditions, recovery of birds from archaeological excavations, and iconographic depictions of birds in numerous examples of petroglyphs and ceramic designs. In this talk, our focus is to holistically examine long-term human-bird interaction on the Pajarito Plateau by using archaeological, ethnographic and iconographic evidence. While previous and ongoing studies from this area suggest a complex relationship between humans and a specific bird, the turkey (*Meleagris gallopavo* spp.), our talk highlights the broader role that birds played in indigenous lifeways throughout the past 1,000 years.

Conrad, Cyler [129] see Kirk, Scott

Consortium, ERC PEGASUS [173] see Orlando, Ludovic

Contreras, Daniel (University of Florida), Benjamin Vining (University of Arkansas) and Aubrey Hillman (University of Louisiana, Lafayette)

[59]

Regional Climates, Local Consequences: Downscaling Climate Data in the Chicama Valley, Peru

The scarcity of long-term and high-resolution climatic records—even where paleoclimatic data are relatively abundant—poses a significant challenge to reconstructing socio-climatic dynamics at the scales associated with human experience. In order for archaeology to realize its potential to contribute to scientific and policy arenas, particularly in the Global South where data are less abundant, this challenge must be addressed. Here, using a case study from the Chicama Valley on Peru's North Coast, we explore this problem through the integration of spatially and temporally uneven instrumental data (publicly available from the Peruvian Servicio Nacional de Meteorología e Hidrología, or SENAMHI), global modeled climate data for the twentieth–twenty-first century (CRU TS, covering the period 1901–2018 at 0.5° resolution), and recent remote sensing measures of localized El Niño–Southern Oscillation (ENSO) effects on vegetation. Higher resolution downscaled reconstructions of local hydroclimates that can account for both "normal" and El Niño regimes make it possible to use published archaeological survey data to assess the potential impacts of human-scale climate variability on past settlement patterns. This is a vital step toward assessing the archaeological implications of both new and existing paleoclimate records.

Contreras, Daniel [125] see Vining, Benjamin

Conway, Meagan (Logan Simpson)

[134]

Migration, Change, and Choice: A Case Study from Early Twentieth-Century Inishark, Co. Galway

This investigation focuses on the ramifications of substantial emigration in the late nineteenth and early twentieth centuries on the dynamics of social life in coastal Irish communities and reformed, identity-based groups of migrants in the United States. Using historical records, oral histories, and archaeological data, this research examines the movements and lifeways of members from a single family from Inishark, Co. Galway to the United States and explores the formation of transatlantic relationships between people

and places, based on places and experiences both remembered and re-created. I consider the material and psychological ramifications of the movements of migrants through the lens of domestic structures and other built architecture in the multi-faceted environments which migrants experience over time. This helps gain an understanding of the changing identity of immigrants and the broader, often complex and complicated, dynamics driving the Irish diaspora. While migrants often left their homes for opportunity and possibility, the driving factors substantially influenced the trajectory of their own lives and the wider communities individuals built together with other migrants.

Cook, Jacob (Texas State University), Nicholas Herrmann (Texas State University) and Krysten Cruz (Texas State University)

[35]

The Applicability of 3D Long Bone Reconstructions and Analyses of Sexual Dimorphism using Stature in Bronze Age Samples
Stature can be used to analyze population health, and investigate patterns of human variation and secular change. We investigate the efficacy of using measures from 3D bone reconstructions, and compare levels of sexual dimorphism in a reconstructed sample to other Greek Bronze Age sites. 3D scans of long bone fragments from Tragana Agia Triada, a Late Bronze Age cemetery in central Greece, are uploaded to the application Fragmento. This produces whole bone models from which maximum bone lengths are recorded. Bone lengths from Lerna, an Early to Late Bronze Age site in the Peloponnese, were gathered from Angel's (1970) study. For both samples, stature is estimated using Trotter and Gleser's (1958) male and female formulae for American Whites using the femur and humerus. Mean stature for the Tragana Agia Triada sample appears to be taller than other Greek Bronze Age sites. An assigned resampling method (Lee, 2001) parses the Tragana Agia Triada individuals into male and female groups, which is used to establish the level of sexual dimorphism in this population for comparison to other sites. Secular change in stature and sexual dimorphism is investigated using the measures from Lerna. Preliminary results show 3D reconstruction may overestimate stature.

Cook, Robert (Ohio State University)

[255]

Small Regions, Big Problems: The Importance of Long-Term Research in Specific and "Marginal" Locales

The most important lesson I learned in graduate school from Alan Sullivan was the importance of developing long-term research projects focused on big human problems but in relatively small geographic settings, often those overlooked in grand normative narratives. During my master's research, I aided Alan's quest to better understand marginal Puebloan subsistence patterns in northern Arizona by challenging the "all Pueblos relied on corn" narrative. We found instead a rich tradition of wild-resource processing focused on earth-ovens and their associated fire-cracked rock spoil piles. Subsequently, in my own research program that started some twenty years ago during my doctoral research and continuing to this day, I have sought to more fully understand the origins and dietary variation of the Fort Ancient culture of the Middle Ohio Valley. The general narrative at the onset of my research was that the Fort Ancient were solely local groups that slowly adopted maize agriculture. My research program focuses on a specific region long suspected to deviate from this model. Indeed, I have found key information that overturns this narrative, specifically that there were a large number of nonlocal Mississippian migrants and that the diet was dominated by maize agriculture at the very onset.

Cook, Robert [221] see Hinkelman, Sarah

Cook, Robert [264] see Mollerud, Katy

Cook Hale, Jessica (University of Georgia)

[238]

"A tale told . . . signifying nothing"

Submerged prehistoric archaeology by its nature depends intensively on natural science methods, particularly where topics such as submerged site formation processes are concerned. As such, it offers potential to advance the state of the art in both methodology and interpretation but must be applied with due care. I present here a case study that demonstrates this concern. In the search for a nondestructive, cost-effective method to "fingerprint" geochemical signatures in lithic corrosion created by submerged contexts, limitations in the methods were encountered. Results show promise for lithic studies in this discipline but underscore the need for critical interpretive methods. In addition to critiquing the method, I will offer suggestions for future approaches that may better accomplish study goals.

Cook-Hale, Jessica [30] see Dunbar, James

Cook Hale, Jessica [18] see Hale, Nathan

Cooley, Delaney [97] see Newton, Kathryn

Coolidge, Frederick (University of Colorado, Colorado Springs) and Victoria Rowe (University of Colorado, Colorado Springs)

[36]

A New Interpretation of Symbolic Thinking in Archaeological Artifacts

A symbol is the use of an arbitrary sign to represent an idea, object, or relationship, occurring in a social context. Anthropologists often invoke Peirce's semiotic concept of symbols to analyze parietal art, figurines, and other artifacts. This paper argues that Peirce's symbol semiotics is no longer adequate for the task of differentiating among obvious and varying cognitive levels of symbolization in artifacts, particularly for archaeological discoveries since his death 105 years ago. In the present paper, we proffer

a three-level interpretation of symbolism: at the first level, determine if the phenomenon can be explained by minimally symbolic cognition (MSC; like Pavlovian conditioning). If so, then higher levels of cognition should not be assumed. Some MSC examples may be sharp flakes and Oldowan stone tools. At the highest level, establish which artifacts undoubtedly represent Fully Immersed Symbolic Cognition (FISC), such as the Hohlenstein-Stadel figurine and the Venus of Willendorf. However, artifacts such as the Makapansgat pebble, the Berekhat Ram figurine, the Blombos Cave engraved ochre, and the Gibraltar Neandertal Tic-Tac-Toe engraving do not undoubtedly represent fully immersed symbolic cognition, but we propose that they may represent an Intermediate level of Symbolic Cognition (ISC; beyond MSC but less than FSC).

Coon, Anna [177] see Noll, Christopher

Coon, Sarah (Purdue University), Jacob Harris (Arizona State University), Zeresenay Alemseged (University of Chicago), Curtis Marean (Arizona State University) and Erik Otárola-Castillo (Purdue University)

[55]

Morphometric Comparison of Early Hominin Butchery Evidence to Carnivore Modifications within a Bayesian Framework

The emergence of stone tools used for butchery by early hominins is a contested topic due to a scarcity of early stone tool evidence. In the absence of tools, the primary trace evidence for their use as butchery implements is bone surface modifications (BSM). However, current BSM recognition protocols are subjective and can lead to conflicting identifications—for example, between cut marks and BSM from carnivores. Canidae species such as *Eucyon wokari* are present in the African Pliocene fossil record at a time when early tool-wielding hominins begin to appear. As canids are known to gnaw on bones, and create BSM that can be incorrectly identified as the result of human butchery behavior, Pliocene canids are candidates for having created BSM currently identified as cut marks. To alleviate this problem, 3D technology coupled with modern geometric morphometrics and Bayesian inference have emerged to differentiate between cut marks and other BSM. Here, we use carnivore modifications on bone, made by wolves (*Canis lupus*) under controlled conditions to compare against experimentally-produced butchery BSM. While canid BSM can appear visually similar to butchery marks, Bayesian inference used in this study can differentiate them and provide a level of probability to their distinction.

Cooper, Jago [239] see Martinez Milantchi, Maria Mercedes

Cooper, Zachary (University of Colorado, Boulder) and Scott Ortman (University of Colorado, Boulder)

[26]

Artifact Density and Population Density in Northern China

Settlement scaling theory (SST) proposes that there should be specific, average, quantitative relationships between extensive measures of population, area, and socio-economic rates in the archaeological sites of a given time and place. Thus far, most applications of these ideas have used measures derived from the built environment. Here, we use data collected by Drennan, Peterson and others in the Chifeng Region of northern China to show that pottery consumption rates, reflected in measured densities of potsherds, increase with overall site areas in a way that is consistent with SST. This result suggests the square root of the artifact density is on average proportional to the population density, leading to new ways of estimating population at sites for which surface architectural remains are no longer present.

Copeland, Sandi [129] see Conrad, Cyler

Corbett, Kathleen and Bonnie Clark (University of Denver)

[112]

Families, Buildings, and Borders: The Architecture of Cultural Interaction along the Santa Fe Trail

For much of the 1800s, the Santa Fe Trail served as a critical trade route connecting Indigenous, U.S., and Mexican markets between the Mississippi River and Mexico City. Artifacts from sites associated with the trail embody cultural innovations that drew from these three traditions. Architecture provides some of the most durable and visible evidence of this hybridity. A prime example are the buildings of Boggsville, Colorado, located along the Mountain Branch of the Santa Fe Trail which ran along what was then the U.S./Mexico border. These standing structures represent a blending of Anglo, Hispano, and Indigenous traditions all in the same settlement. In these respects, the architecture reflects the heritage of the multi-ethnic families who lived at the site. Drawing from archaeology, historic research, and architectural analysis, this talk highlights both the nature of these colonial buildings and also their significance. In a time of ever-hardening borders and identity politics, they serve as critical reminders of the deep history of interconnection and fluidity across nations.

Corcoran-Tadd, Noa (Princeton University), Arturo Rivera Infante (Centro Peruano de Arqueología Mari'tima y Subacua), Barbara Carbajal Salazar and Sarah Baitzel (Washington University, St Louis)

[242]

Todas Las Cremas: Shifting Landscapes of Mobility on the Far Southern Coast of Peru (AD 1000–1920)

Recent field work in Tacna (far southern Peru) by a joint team from Leiden and Washington University in St Louis has investigated the long-term landscape history of the Sama Valley and its desert margins. Located between the research hotspots of Moquegua and Arica, the valley has long been overlooked by archaeologists. At the same time, it is well positioned to offer new insights into classic debates about ecology and mobility, ethnicity, and the transforming political economies of the late prehispanic and historic periods. Here we present an initial analysis of recent data on the long-term patterns of connectivity that articulate Sama with wider networks of mobility and exchange. Using a combination of remote sensing and intensive pedestrian survey, the Proyecto

Arqueológico del Valle de Sama 2019 field season recorded evidence for multiple routes through the intervalley desert pampas that border the lower Sama drainage. The results highlight the utility of intensive coverage in apparently marginal intervalley landscapes and reveal a complex palimpsest of routes and ephemeral sites relating to Cabuza, Gentilar, Inca, and historical periods of use.

Cordell, Ann (Florida Museum of Natural History) and Maureen Meyers (University of Mississippi)

[123]

Petrographic Analysis of Sherds from a Fourteenth-Century Mississippian Frontier Chiefdom in Southwestern Virginia

The Carter Robinson site is a fourteenth-century Mississippian frontier located in southwestern Virginia. Previous attribute analyses of ceramics from the site have identified change over time that suggests increased affiliation with neighboring groups. This affiliation coincided with mound-building and an increase in craft specialization at the site. A petrographic analysis of 47 sherds taken from four houses and stratigraphic mound excavations was done to more precisely understand the relationship between groups and if this relationship varied by household and mound and non-mound contexts. This poster will describe the results of this analysis and re-evaluate earlier analyses based on these results to better understand ceramic production at frontier areas.

Cordell, Ann [123] see Duke, C. Trevor

Cordero, Robin (Office of Contract Archeology, Univ. of New Mexico) and Jamie Stevens (Office of Contract Archeology, Univ. of New Mexico)

[129]

Winter Garden Hunting along the Rio Grande Flyway: A Case Study in the Procurement of Migratory Birds by Pueblos along the Rio Grande

Garden hunting is a topic that has received substantial attention in archaeofaunal research over the past 30 years. However, these studies have tended to focus on hunting in active gardens during the growing season, or in fallow fields. Consequently, these past studies have often focused on the procurement of small game (rodents, leporids, and birds) who frequent active and abandoned fields. The goal of this research is to present evidence for a form of garden hunting that has not received as much attention in the literature—garden hunting of fields in the winter. The influx of Pueblo farmers and expansion of farmland along the Rio Grande floodplain during the late AD 1200's caused a significant northward shift in the overwintering grounds of migratory birds, namely cranes, geese, and ducks. Previous researchers argued that Puebloan groups hunted these birds for use in ceremonies and for the construction of ritual paraphernalia, and were not consumed. This presentation will first present evidence to evaluate if these winter migratory birds could have been procured for subsistence. This will be followed by a discussion of the broader ramifications of birds and issues of territoriality and identity in the Eastern Pueblo region.

Cordova, Carlos and William Johnson (University of Kansas)

[19]

The Pollen and Phytolith Record from Hall's Cave, South-Central Texas: Vegetation Change and Paleoclimatic Trends

Pollen and phytoliths from the sediments of Hall's Cave (south-central Texas) indicate that between about 18,000 and 16,500 cal yr BP the cave area was dominated by an open plant community consisting of herbaceous vegetation, dominated by C_3 grasses, and scattered trees, primarily *Quercus* and *Pinus* species. After about 16,500 cal yr BP, the arboreal component fluctuated, attaining a peak between 14,000 and 13,000 cal yr BP with relatively equal proportions of C_3 and C_4 grasses, including a sizable proportion of *Panicoidae* grasses. The Younger Dryas is marked by a conspicuous decrease in arboreal pollen with an apparent increase of C_4 grasses toward its termination. Early Holocene recovery of arboreal vegetation is followed by a drying trend marked by the increasing dominance of C_4 drought-tolerant *Chloridoideae* grasses. Increasing human use of the cave in middle-to-late Holocene times creates noise in the pollen and phytolith record for a proper climatic reconstruction. The next stage in the investigation aims at modeling climatic trends using phytolith data, applying morphometric data on grass silica short-cell (GSSC) phytoliths to obtain precise grassland composition.

Cordova, Carlos

[219]

Moderator

[219]

Discussant

Cordova, Carlos [269] see Cesaretti, Rudolf

Cordova, Carlos [75] see Raskevitz, Thornton

Córdova Tello, Guillermo and Estela Martínez Mora (DEA-INAH)

[144]

Entorno espacio-temporal del Grupo F y estructura F7 de Tamtoc

Uno de los principales objetivos del Proyecto arqueológico "Origen y desarrollo del paisaje urbano de Tamtoc, SLP" es el de aproximarnos al conocimiento de los procesos de cambio experimentados por la sociedad que protagonizó su devenir urbano desde fechas cercanas a 200 a.C. hasta la llegada de los ibéricos a la región. Anotaremos algunas ideas respecto a la evolución social y al ritmo de los cambios transcendentales vistos desde el registro arqueológico estudiado desde 2008 en diferentes conjuntos arquitectónicos, tanto al interior como fuera del núcleo urbano de Tamtoc, con el propósito de establecer el contexto espacio-temporal del llamado Grupo F y Estructura F7, motivo principal de discusión de nuestra mesa.

Córdova Tello, Guillermo [144] see Martínez Mora, Estela

Córdova Tello, Mario [150] see Jurado, Erik

Corkum, Alex [107] see Gaffney, Chris

Corl, Kristin (University of Texas, San Antonio) and William Walker (New Mexico State University)
[136]

Constructing Community: Intersite Variability of Communal Architecture at Cottonwood Spring Pueblo

Recent and ongoing excavations in Southern New Mexico on either side of the San Andres Mountains are revealing a story of massive population movement and social reorganization. Construction of communal spaces in the Mogollon for social and ritual purposes was culturally important, but during the late pueblo period, communal space was vital in helping to integrate people into a core community. Cottonwood Spring Pueblo, an El Paso Phase (AD 1300–1450) community, comprised linear and plazas pueblos as well as rock art and shrine features offers an ideal case study. The communal spaces identified across the site are a window into the larger story of aggregation, reorganization and movement of people across the greater southwest. Excavations at Cottonwood Spring Pueblo have identified significant variation in structure types and use of communal spaces across the shared landscape, providing insight into where these people were coming from, and why they chose to come together on the western edge of the Jornada-Mogollon.

Corl, Kristin [136] see Arakawa, Fumi

Corl, Kristin [179] see Munoz, Cynthia

Corneli, Katharine [258] see Riley, Tim

Coronado, Anabella (Universidad del Valle de Guatemala)
[209]

Discussant

Correa, Letícia (University of São Paulo) and Astolfo Araujo (University of São Paulo)
[232]

Lithic Variability in an Ecotone Area: The Case of São Paulo State

The São Paulo State (SE Brazil) is located in a transition area between rainforest and savanna. Preliminary archaeological data suggests that this area shows a larger cultural variability when compared to other regions toward north and south (Minas Gerais and Paraná states). Considering these two conditions, in order to understand the spatial dispersion of hunter-gatherer groups during the Holocene, this project aims to test two hypothesis: if the cultural variability can be associated to different biomes or if could be better explained considering cultural transmission processes. However, São Paulo archaeology is not very well known. In spite of the large number of CRM projects carried out, most information is available in “gray literature” such as reports and websites. Trying to overcome this situation our project is performing an intense research about lithic sites, both in academic literature and CMR reports. The most representative lithic collections found in the reports were analyzed considering technological and morphological aspects. The preliminary results suggest a very rich lithic scenario for state since early times.

[232]

Chair

Correa, Pablo [150] see Carballo, David

Cortes-Rincon, Marisol (Humboldt State University), Cady Rutherford (University of Texas, San Antonio), Jeremy McFarland (Humboldt State University), Michael McDermott (Humboldt State University) and Spencer Mitchell (University of California, Santa Barbara)

[230]

Lidar: Guided Archaeological Surveys in the Hinterlands of Northwestern Belize

In the last decade airborne mapping lidar has become an extremely valuable tool for archaeologists studying ancient settlement patterns. It has proven especially useful in regions covered by dense forests on which prospection with other remote sensing techniques is not possible. This paper contributes to the growing international dialogue regarding the use of lidar for archaeological studies by providing examples of features that have been discovered in this region, how these features can be interpreted, and how these interpretations can contribute to theoretical anthropological perspectives regarding how humans divide and utilize the landscape. Our remote and field analysis has positively identified numerous archaeological sites that were not been previously recorded. The authors report on results from the last three seasons of the multidisciplinary Dos Hombres to Gran Cacao Archaeology Project (DH2GC). Among its main objectives, this project investigates the sociopolitical nature of the study area through architectural, material cultural remains, and geospatial analyses integrated into a regional lidar dataset. Using key markers to define areas of specialized activity within each excavation and occupational layers across the study area, we have begun reconstructing the dynamic history of the study area.

[230]

Chair

Cortes-Rincon, Marisol [7] see McDermott, Michael

Cortes-Rincon, Marisol [206] see McFarland, Jeremy
 Cortes-Rincon, Marisol [53] see Mitchell, Spencer
 Cortes-Rincon, Marisol [178] see Rutherford, Cady
 Cortes-Rincon, Marisol [230] see Smith, Byron

Cory, Mackenzie (Indiana University) and Edward Herrmann (Indiana University)
[198]

A Phenomenologically Reflective Approach to Understanding Early Paleoindian Landscapes

Though the phenomenological interplay of physical locations simultaneously existing as a space and a cultural construct is widely examined and critiqued in the field of landscape archaeology, a locus exists in the application of this body of theory to Early Paleoindian sites. The process through which archaeologists generate Early Paleoindian landscapes by creating, populating, and interpreting an imagined past remains an unanswered question when only archaeological theory is considered. We seek to correct this by casting a broader net into contemporary works from the fields of informatics and philosophy of science. We then turn the analysis toward ourselves and our tools by examining how the PaleoIndiana project generated a statewide GIS model of Early Paleoindian lithic transport pathways and subsequently interpreted these data. Ultimately, the research process mirrors how we imagine the creation of other, non-academic, social landscapes and the result is a Paleoindian landscape with meanings wholly assigned by researchers in the present as a representation of (imagined) inhabitants of the past. It was only after we came to appreciate how our research processes generated an archaeological landscape that we questioned those same processes and gained a more holistic understanding of our research area.

Costa, August (Coastal Environments Inc.)
[198]

Stewardship of Submerged Prehistoric Cultural Resources and Beach Nourishment at McFaddin Beach (41JF50), Jefferson County, Texas

Since 2017, Coastal Environments Inc. (CEI) has facilitated new archaeological investigations related to submerged cultural resources at McFaddin Beach in Jefferson County, Texas. McFaddin Beach (41JF50) lies along ~35 miles of shoreline stretching from High Island in the west to Sea Rim State Park in the east. The site has produced items that are thought to have washed ashore from an unidentified location in the Gulf of Mexico. Documented finds from McFaddin include prehistoric lithic artifacts as well as Pleistocene faunal remains. The site is best known for yielding a large volume of Clovis points collected by beachcombers over many decades. This paper will review what is known about the McFaddin Beach site and present preliminary results of ongoing investigations related to beach-replenishment activities, including archeological monitoring of dredge spoil and a geoarchaeological assessment of offshore borrow pit core samples.

Costa, Philippe (University Paris 1 and CEMCA), Priscilla Molina Muñoz (Museums of the Costa Rican Central Bank), Martin Künne (Bonn University), Eric Gelliot (University Paris 1, CEMCA and INRAP) and Simon Mercier (University Paris 1 and CEMCA)

[189]

The Excavation in the Yegüitas Rock Shelter in Costa Rica, a Clue for a Chronological Link

The Mountain Range Guanacaste Archaeological Project investigates rupestrian art in Guanacaste, a province located in Costa Rica (northwest). This project results from international collaboration of the French, German and Costa Rican institutions: CEMCA, Bonn University and the Museums of the Costa Rican Central Bank. The first stage is centered in the Pedregal site, a large savanna with more than 200 engraved boulders located in the west slope of the Orosi volcano. The project at Pedregal encountered difficulties in dating the engravings located at the site; therefore, we set the goal to start with one rock shelter called Las Yegüitas, discovered by the project in 2018, which has uncarved drawings in a panel at the entrance. Las Yegüitas is located 2 kms south of the Pedregal site, approximately 20 kms south of the Nicaraguan border. We conducted an excavation of 2x1 mts, given the small dimensions of the cave; and we found materials which we claim belong to the Tempisque Period, circa 500 a.C.-300 d.C. In this study we present the motivations, methodology, and preliminary results of the excavation at Las Yegüitas.

Costello, Julia

[58]

Foothill Resources

Foothill Resources Ltd. (Foothill) was established as a limited partnership in 1983 by Julia G. Costello, historical archaeologist, and Judith Marvin, historian and architectural historian. The firm was incorporated in 1992 and certified as a 100% DBE soon after. Foothill specializes in addressing management needs for historic period sites in California, particularly those related to Spanish colonization, Euro-Asian immigrations, urbanization, mining, and the development of agriculture and industries. Established early in the growth of CRM, Foothill often served as a sub-consultant on large state and federal projects researching, evaluating, and providing mitigation for historic period sites.

Couey, Lauren (University of Denver)

[134]

Building Place: Analysis of the Built Environment in a Chicago Immigrant Community

This discussion investigates the built environment, specifically in terms of architectural style, structural modification, and structure spatial arrangement, assessing changes to these features over time in a historic immigrant community in Chicago, Illinois. This examination of the built environment is used to understand how shifts in the cultural fabric of the community are reflected in the physical characteristics of its structures and their spatial arrangement, as well as how immigrant communities engage in

placemaking to alter the existing structures around them and rebuild a sense of home and identity after the trauma of migration. Also considered is the temporality of the built environment, and what aspects of the immigrant experience may be untraceable as city communities are subject to development efforts and political intervention.

Coughenour, Chance, Stanley Walling (Community College of Philadelphia), Shawna Veach (Google) and Bryan Allen (Google)

[230]

Lidar and Ancient Maya Commoners: Landscape, Settlement, and Ceremonialism on a Regional Scale

Lidar provides archaeologists with unprecedented imagery of ancient architecture that has been obscured by forest for centuries or more. In the Maya lowlands, much attention has been paid to lidar's revelation of previously unknown cities, reservoirs, intersite causeways, and other substantial vestiges of this ancient culture. This paper focuses on the use of lidar to reveal the much less substantial remains of commoner life. Although lidar provides Mesoamerican archaeology with what is perhaps the most effective recent tool for defining commoner cultural remains on a regional scale, this technology has its limitations. This discussion will consider these limitations, as well as the benefits and potential of lidar in the investigation of Maya commoner life.

Coughlin, Sean [192] see Silverstein, Jay

Countryman, James (University of Chicago)

[124]

Feral Fields of the Eastern Adriatic Coast: Queering Boundaries of Cultivation and Wildness

On Mediterranean islands and coastal areas of southern Europe, drystone field walls, terraces, and clearance cairns are common landscape features; extensive field systems are often readily observable through aerial reconnaissance. While tracing the precise chronologies of these fields is perennially challenging, they surely attest to generations of landscape modification for cultivation. But what does field architecture in itself mean for the particular labor practices and agroecologies that such fields might contain?

Drawing on contemporary in-situ observations of abandoned and semi-managed olive groves on a Croatian island (Ugljan, Zadar archipelago), and thinking with queer-feminist theories of the feral, I argue that architecturally well-defined fields do not necessarily represent clear-cut boundaries between wild/unmanaged space and spaces of cultivation/domestication/control. On Adriatic islands, olive gardens provide habitat for a diverse assemblage of plant life, intentionally cultivated and otherwise. I bring these observations to bear on new archaeobotanical evidence for a florescence of olive cultivation in the eastern Adriatic in the first to second centuries, associated with Roman colonization. What can the macrobotanical record illuminate about the ecological ramifications of a pivot from cereal agriculture to arboriculture, or the different forms of labor associated with these modes of cultivation?

Countryman, Linda [175] see Franklin, Jay

Covert, Alexandra (Flagstaff Area National Monuments)

[148]

From Water to Land: Analysis of Prehistoric Shell at Wupatki Pueblo

Wupatki Pueblo has a high concentration of prehistoric shell artifacts. Through a literature review, analysis, and spatial analysis, this research project examined the prehistoric shell artifacts from Wupatki Pueblo. This research project determined trade routes of shell to Wupatki Pueblo from the coast of California, Gulf of California, and Gulf of Mexico. Additionally, shell artifacts housed at the Museum of Northern Arizona were analyzed by species and artifact type. Spatial analysis was conducted on the artifact types by placing the artifact types into the North Unit and South Unit of Wupatki Pueblo to determine discernable user patterns. Ultimately this research project gives insight into prehistoric trade networks and the significance of shell objects to the people of Wupatki Pueblo.

Covey, R. Alan (University of Texas, Austin), Robert Selden Jr. (Stephen F. Austin State University), Nicole Payntar (University of Texas, Austin), Astrid Runggaldier (University of Texas, Austin) and Charles Spencer (American Museum of Natural History)

[17]

Geometric Morphometric Analysis of Inca Jars from Two Public Collections

Found from highland Ecuador to northwest Argentina, the Inca narrow-mouth jar, or aribalo, is the most widely distributed marker of the period of imperial expansion across the Andes (c. 1400–1530s). Hiram Bingham made the first formal description of the aribalo more than a century ago, as part of the first formal classification of Inca pottery. In the past century, other researchers have noted variations in shape and surface decoration seen in excavated aribalos and jars from museum collections. These differences might be attributed to differences in workshop practices or provincial identity across the empire, but no quantitative analysis of vessel shape has yet been published. In this paper, we present the preliminary results of an ongoing project that has produced high-resolution 3D scans of Inca jars from the University of Texas Art and Art History Collection and the Bandelier Collection at the American Museum of Natural History. We present the results of geometric morphometric analysis to assess the consistency of shape seen in 29 Inca aribalos that were produced in different parts of the Inca Empire. This research provides significant insights into Inca potting practices, which can be compared with the production technologies and vessel shapes of earlier Andean societies.

Covey, R. Alan [175] see Payntar, Nicole

Cowie, Sarah (University of Nevada, Reno), Diane Teeman (Culture & Heritage Department of the Burns Paiute), Ashley Long (BLM Shoshone, ID Field Office) and Patrick "De'ileligi" Burr (Washoe Tribe of Nevada and California and Arizona)
[97]

Two Case Studies in Indigenous Archaeology by, with, and for American Indian Communities in the Great Basin

Two case studies in collaborative archaeology demonstrate the challenges and benefits of conducting research "by, with, and for" Native communities, from the projects' inception to publication. Related heritage teams first conducted work at Nevada's historic Stewart Indian School that was used in federal efforts to assimilate Native children from throughout the western U.S. Building on lessons from that project and expanding our networks, we are now engaged in the "Our Ancestors' Walk of Sorrow" project to illuminate the removal of many Paiute, Shoshone, and Bannock people from their homelands. Both case studies demonstrate that processes of governmentality, disciplinary power, and legislative processes entangled with biopolitics and knowledge production have similarly acted upon landscapes, human bodies, and material culture. In the employment of collaborative and indigenous archaeologies, living community members with blood and other ties to these landscapes are contributing tribal knowledge and oral history as research partners. Through such partnerships, our work groups have developed a more complete picture of our shared history. Holistic approaches to understanding the past also may assist mitigation of inter-generational trauma and historical grief accompanying many such landscapes of conflict, and can give guidance for improving the management of Indigenous heritage on public lands.

Cox, Kim

[16]

Paint Rock: The Ethnography and History of the Rock Art

In his book *Comanche Land*, J. Emmor Harston discusses his interactions with the Comanche Indians of Central Texas. Oral histories of the Comanches from the time of Coronado up until the late nineteenth century were documented in the rock art of Paint Rock, Texas. This fact lends a great amount of credibility to the writings of Harston and the oral histories of the Comanches that he recorded.

Cox, Whitney (Rowan University)

[16]

Paint Rock: The Religious Foundations of the Rock Art

The sacredness of time was a fundamental concept to the prehistoric peoples of Mesoamerica and the American Southwest. Uto-Aztec speaking groups saw time as cyclical and incorporated that concept in their artwork. One of the best examples of this concept is found at Paint Rock, Texas where the idea of cyclical time, or creation and recreation, was embedded in the landscape.

Crable, Barbara [68] see Hofman, Jack

Crable, Barbara [236] see Rapes, John

Crabtree, Pam (New York University) and Taylor Zaneri (University of Amsterdam)

[22]

Using Zooarchaeology to Explore the Origins of Medieval Urbanism: Evidence from Badia Pozzeveri near Lucca, Antwerp, and Ipswich

The origin of urbanism is one of the most significant transitions in human history. Archaeologists and historians have been interested in the origins and development of early medieval urbanism since the days of V. Gordon Childe and Henri Pirenne in the early twentieth century. While most of the early studies of medieval towns were based on historical sources, archaeological research carried out in the late twentieth and twenty-first centuries have provided new data on the process of urbanization in medieval Europe. In this paper, we use zooarchaeological data from Badia Pozzeveri near Lucca in Italy (ca. 900–1300 CE), Antwerp in Belgium (eighth through eleventh centuries CE), and Ipswich in the United Kingdom (seventh through twelfth centuries CE) to address two related questions: 1. How did early urban populations obtain food and other animal products from the surrounding countryside, and 2. To what extent were people living in the countryside participating in urban markets?

Crabtree, Stefani (Santa Fe Institute & Utah State University) and Jennifer Dunne (Santa Fe Institute)

[26]

The ArchaeoEcology Project: Examining Common Modalities of Human-Ecosystem Interaction Worldwide

There is increasing awareness that our understanding of the dynamics and stability of human systems cannot be uncoupled from their environmental and ecological context. Most of the work on what are called "socio-ecological systems" or "coupled natural-human systems" focuses on modern systems. However, there is an enormous amount of anthropological and archaeological knowledge that can deeply inform, enhance and transform our understanding of socio-ecological dynamics and sustainability. Work on past systems where we know the system's trajectory can provide a powerful framework for addressing socio-ecological resilience, stability and robustness in response to natural and human perturbations and change. In this paper we examine "How do human interactions with biodiversity shape socio-ecological dynamics and sustainability?" Our work in collating data from six well-studied systems that range in scale from aboriginal foragers in Australia, to growing polities in the American southwest, to chiefdoms in the South Pacific and warring Norse states enables us to examine the modalities of human-environment interaction from deep time until today. By examining the many ways that people in these societies interact with and within their ecosystems we can understand commonalities of sustainability, resilience, and vulnerability to external environmental shocks.

Crabtree, Stefani (The Santa Fe Institute & Utah State University)**[115]***Discussant*

Crabtree, Stefani [171] see Bocinsky, Kyle

Crabtree, Stefani [165] see Ellyson, Laura

Craib, Alexander [103] see Ballenger, Jesse

Craig, Jessica (Central New Mexico Community College), Eleanor Harrison-Buck (University of New Hampshire) and Astrid Runggaldier (University of Texas at Austin)**[14]***Terminal Classic Ancestors and the Eastern Shrine of Chikin Chi'Ha, Belize*

Investigations of an eastern shrine building in a residential group at Chikin Chi'Ha exposed a complex burial of an adult male and three children under the age of two who were placed near his head and feet. While there is abundant evidence for the construction and use of Classic period eastern shrines in the Maya Lowlands, ceramic analysis from Chikin Chi'Ha suggests this building was modified multiple times and dates primarily to the Terminal Classic-Early Postclassic transition (ca. AD 830–1200). The primary burial interment was in a supine position with legs folded up at the knee—a highly unusual configuration. Both the burial and the eastern shrine dating to the Terminal Classic are somewhat of an anomaly for the Belize River Valley. Evidence for transition, upheaval, and migration have been documented at many Lowland Maya Terminal Classic sites. Here we cross-examine the possibility that this atypical burial and shrine building at Chikin Chi'Ha are the result of an influx of newcomers into this region who introduced new traditions, while also perpetuating “old” Classic Maya narratives concerning an eastern association with ancestor rituals and human sacrifice during this tumultuous time.

Craig, Oliver [229] see Gaffney, Isabella

Cramb, Justin (University of Georgia)**[252]***The Mystery Dogs of Remote Oceania: An Archaeological and Ethnohistorical View of Domestic Dog Introduction and Loss in the South Pacific*

Domestic dogs (*Canis familiaris*) comprise one part of the suite of plants and animals transported by voyagers to the islands of Remote Oceania. The distribution of these, and other domesticates, is inconsistent from island to island and from archipelago to archipelago. New archaeological fieldwork, zooarchaeological analysis, and AMS dating demonstrate that settlers introduced dogs to the atolls of Manihiki and Rakahanga in East Polynesia at the time of the first human arrivals ca. AD 1290–1390 and maintained them until after European contact in AD 1606. Dogs died out on the atolls prior to missionization in AD 1849. Archaeological reports and ethnohistoric text analyzed for thirty-five islands/ island groups in Remote Oceania reveal regional patterns of introduction and loss. The findings indicate that voyaging peoples introduced dogs to the majority of island groups in Remote Oceania before European contact, and that rates of pre-European localized extinction were high. The highest rates of loss occur on low coral islands suggesting that low island vulnerabilities and spatial constraints on population size may affect dog survivorship. This analysis suggests that the dogs of Remote Oceania have a complex history in which introduction to new islands was common, but long-term survival was difficult.

[252]*Chair***Crass, Barbara (Museum of the North, University of Alaska, Fairbanks), Jeffrey Behm (University of Wisconsin, Oshkosh) and Charles Holmes (University of Alaska, Fairbanks)****[82]***Experimental Reproduction of Swan Point Bone-Fueled Hearth Remains*

Bone-fueled hearth remains were discovered in the lowest level (ca. 14,000 years ago) of Swan Point, central interior Alaska, in 2003. The hearths are associated with ivory and lithic workshop areas. Laboratory experiments began in 2004 and the first outdoor bone only fueled fire was in 2006. Multiple outdoor fires have been burned since and remains observed for more than a decade. The taphonomic effects of weather and animals have broken down large piles of bone into remains which closely resemble what is found archaeologically. Laboratory experiments using the residue found in the substrate beneath the fire provide further insights into the effects of numerous freeze/thaw cycles and water percolation. Many of the observed features of the archaeological bone-fueled hearths can be reproduced experimentally.

Crass, Barbara [82] see Krasinski, Kathryn

Crass, Barbara [82] see Wygal, Brian

Crawford, Dawn (Southern Methodist University), Michael Callaghan (University of Central Florida), Daniel Pierce (Universite Bordeaux-Montaigne, France), William Gilstrap (Massachusetts Institute of Technology) and Brigitte Kovacevich (University of Central Florida)**[39]***Ceramic Production During the Terminal Classic at Holtun, Guatemala*

The use of provenance studies to answer anthropological questions related to the production and access of ceramics is well

documented for the Maya region. Mineralogical and chemical compositional analyses are often used to identify the material origins, or provenance, of ceramics. In this paper, the authors report on Neutron Activation Analysis (NAA) and ceramic petrography of serving and utilitarian vessels recovered from Terminal Classic-period elite and non-elite domestic contexts at the Maya site of Holtun, Guatemala. The research is part of Crawford's dissertation research, which examines economic resilience expressed through non-elite choices related to production during the Terminal Classic period at Holtun. Preliminary NAA results show that Terminal Classic potters were using chemically distinct clays exhibiting different paste fabrics than previously studied Preclassic pottery at Holtun. In addition, chemical composition during the Terminal Classic period does not appear to match other sites in the Maya lowlands. However, petrographic data show that Terminal Classic period potters continued to use local carbonate materials for pottery production. This is part of a long-lasting local tradition of potter manufacture that can be traced back to the Middle Preclassic period. The authors will present preliminary data and discuss its implications in light of resilience theory.

[39]

Chair

Creager, Brooke

[211]

Migration and Ritual Adaptation

After a migration, there is a period of adaptation in reaction to the new landscape and interaction with native groups. The adaptations occur, to a degree, in every aspect of life including ritual practices. Examining ritual expressions of religion in a migration context reveals how cultures adapt in the first phases of contact and how the ephemeral aspects of society are impacted. When practical materials, like pottery or elite trade goods, are integrated into a society's practice, it can be explained through practicality and the value of new materials. When religions change, it reflects a shift in worldview. Religion may only be represented archaeologically through iconography and ritual practices, but changes in these materials suggests a change in the belief system. This paper uses the Anglo-Saxon migration as a case study to examine how the ritual practices of both native and migrant groups adapt.

[211]

Chair

Creamer, Emma [119] see Geiger, Elspeth

Creel, Darrell (University of Texas, Austin)

[136]

The Enduring Importance of Mimbres Great Kivas

In Swarts and other Mimbres villages, the location of great kivas and associated pithouses marked important ritual loci during the Late Pithouse period. The same loci continued to be used for very large, probably communal rooms as well as special habitation rooms through the Classic period. There is mortuary evidence indicating that specific families were responsible for great kiva construction, maintenance, and rituals and that this responsibility also continued through the Classic period. With population growth during the Classic, membership in a group responsible for kiva ritual may have expanded, thus serving to integrate the village.

Creese, John (North Dakota State University)

[12]

Assertive Egalitarianism and Its Contradictions: Inter-household Spatial Relations and Emergent Social Assemblages in Fifteenth–Seventeenth-Century Northern Iroquoian Villages

Ancestral Wendat societies of the lower Great Lakes have often been considered quintessential exemplars of "tribal egalitarianism" in neoevolutionary terms. But, as a number of commentators have noted, egalitarianism isn't the default human condition any more than inequality or hierarchy—it must be worked at, as against various countervailing forces and interests that might lead to its erasure. In this paper, I explore the tensions and contradictions inherent in the assertive egalitarianism of the fifteenth–seventeenth century Wendat from the standpoint of inter-house spatial relations. Assemblage theory provides an alternative framework for understanding the role of materiality and space in the sociopolitical dynamics of small-scale societies.

Crespo, Fabián [143] see Scheinsohn, Vivian

Cressler, Alan [60] see Simek, Jan

Crevecœur, Isabella [171] see Brandt, Steven

Criado-Boado, Felipe

[207]

Discussant

Criado-Boado, Felipe

[263]

Exploratory Eye Movements to Archaeological Objects Illustrate the Coupling of the Material World and Social Complexity through History

The eye-tracking of prehistoric pottery from very distinct archaeological societies has revealed that the way of visually appraising objects is directly connected, through the visual saliency, to their design, what pinpoints a continual loop and correlation between visual behavior and physical shapes that may also be linked to social complexity. This correlation between the physical structure of the objects and the resulting visual behavior suggests that the engagement between material styles and socio-cultural domains, often postulated by Archaeological, Cultural and Visual studies, is mediated (or even constructed) by visual behavior. These results therefore suggest that visual behavior would be the underlying driver that explains why changes in material styles echo socio-cultural changes, an issue that has so far remained unexplained in cultural studies.

Crider, Destiny (Luther College), Daniel Pierce (University of Missouri Archaeometry Laboratory), J. Heath Anderson (Minnesota State University Mankato) and Michael Glascock (University of Missouri Archaeometry Laboratory)
[150]

Revisiting Tula, Hidalgo Epiclassic Ceramics: Progress and Recent NAA Results

Significant progress has been made in the description and definition of typological and compositional assemblages of Tula, Hidalgo regional ceramics during the Epiclassic period of the Central Highlands. Neutron Activation Analysis conducted at the Archaeometry Laboratory and the Research Reactor Center at the University of Missouri (MURR) now includes contributions from multiple researchers. We report the findings from the 119 Epiclassic ceramic samples submitted to MURR from Anderson's Proyecto Cerro Magoni, a large Epiclassic settlement, and a ceremonial center located on a hilltop within the viewshed of Tula Chico. The ceramic types selected reflect a diversity of well-known styles found throughout the Central Highlands and a handful of types not common to the Basin of Mexico, but are increasingly recognized for relationships northwest toward the Bajío. Emergent composition groups from this dataset will be discussed in relation to previous composition sampling of the Tula and Basin of Mexico studies by Crider and others. We will provide a discussion on how these results provide new evidence and inform our interpretive frameworks on questions on ceramic production and exchange in the region, and highlight key domains for further study both within Hidalgo and in relation to neighboring areas in the highlands.

Crist, Walter (Maastricht University) and Cameron Browne (Maastricht University)
[175]

Reconstructing Ancient Board Games Using AI Techniques: The Digital Ludeme Project

Advances in Artificial Intelligence allow us to revisit the question of finding the rules for ancient games. With our game software Ludii, the Digital Ludeme Project aims to use archaeological and historical data for the most important 1,000 games in human history to calculate likely rulesets for ancient games and construct a platform for people to play them. The concept of a ludeme, which describes a conceptual unit of a game's rules, is useful for reconstructing lost games. In our project, we are collecting archaeological, textual, art historical, and ethnographic data on ancient games, determining which ludemes they provide evidence for, and then will use AI to fill in the gaps of our knowledge with ludemes from related games. The AI will test the playability of these ludeme combinations and provide probability scores for the reconstructions based on our confidence in the evidence and the AI's calculations of playability. Our research will be made public in an Open Access platform where people can play against either an AI or human opponent. This project seeks to preserve this kind of intangible cultural heritage that over the past 100 years has been lost as people stop playing these games.

Cromwell, RP (University of Nevada, Reno), Makayla O'Rourke (Oregon State University) and Tara Tran
[77]

A Comparison of Projectile Points from the Lake Abert Basin, Lake County, Oregon.

The authors employ a morphological analysis of projectile points associated with landforms located on the east and west shores of the Lake Abert Basin, Oregon. Utilizing established projectile point typologies for the Northern Great Basin (Thomas 1981; Oetting 1989; Largaespada 2006), the abundance and density of projectile points are compared. The projectile point assemblages serve as a proxy for the intensity of use for each landform. We expect that a comparison of frequency and distribution of projectile points on each landform will allow for interpretations about land-use and settlement decisions inhabitants made throughout the Holocene.

Cron, Lindsey (New Mexico State University), Jorden Scott (New Mexico State University), Ashlyn Wagoner (New Mexico State University), Dustin Wagner (New Mexico State University) and Fumi Arakawa (New Mexico State University)
[122]

The 2019 New Mexico State University Field School at South Diamond Creek Pueblo

The 2019 New Mexico State University Field School in the Gila National Forest continued excavations from a 2017 field school at the South Diamond Creek Pueblo (SDCP) site. This project aimed to excavate significant portions of a communal structure initially started in the 2017 field school. The goal of this field school was to recover as much information as possible in relation to the kiva and the site in its entirety to better explain the use of the area by prehistoric peoples. Findings from the excavation include details on the overall structure of the kiva, new artifact assemblages—two cloudblower pipes, a broken shell pendant, and a possible animal figurine—as well as new potentially datable charcoal and macrobotanical samples. Data from this excavation is still being processed but is likely to date to the Georgetown phase (AD 550–650) occupation. Because the SDCP kiva shows similar architectural configurations and features to the great kiva excavated at the Galaz site in the Mimbres River Valley (approximately 40 miles away), the results of the SDCP kiva can provide crucial information about broader communities of practice by the pithouse community in the northern Mimbres region and the Mimbres River Valley.

Cron, Lindsey [136] see Arakawa, Fumi

Cross, Benjamin [78] see Comstock, Aaron

Cross, Benjamin [221] see Hinkelman, Sarah

Crowley, Brooke [76] see Hixon, Sean

Crowley-Champoux, Erin (University of Minnesota)
[22]

Reconstructing Animal Economies of Early Ireland in Transition

In Ireland, one of the defining features of the transition from the Iron Age to the Early Medieval Period, during the first centuries AD, is the development of a dairying economy. The concern for dairy as a commodity had social and political consequences for Early Medieval society; with status reflected in quantities of dairy cattle and social obligations of hospitality expressed in butter and cheese. The development of this system, however, is not well understood. This paper presents the initial findings from zooarchaeological analysis of the animal remains from Laytown, Co. Meath. Excavation at this site demonstrated a long sequence of occupation from the Late Iron Age through the Early Medieval Period, examining the transition from the prehistoric to the medieval. At times the site was primarily a settlement and, at others, a site inflected by ritual expression and burial. This demonstrates not only change over time but also the use of animals in various social contexts. By examining this period of social and political transformation, I question narratives of continuity and change as well as the staid interpretations of resource exploitation and economic development during this period.

Crown, Patricia (University of New Mexico)
[88]

Discussant

Crown, Patricia (University of New Mexico) and Patrick Lyons (Arizona State Museum, University of Arizona)
[129]

Cultural Diversity and the Macaws and Parrots of the Arizona Mountains

One of the highest concentrations of macaws and parrots in the U.S. Southwest was recovered from four sites in the mountains of east-central Arizona: Grasshopper, Kinishba, Point of Pines, and Turkey Creek Pueblos. This study re-examines the evidence for acquisition, care, and discard of the birds between about AD 1250 and 1400. Given the strong evidence for diverse cultural groups living within these villages, these assemblages offer an unusual opportunity to examine how varied beliefs regarding appropriate disposal practices created intrasite and intersite patterns.

Cruger, Holly (University at Albany)
[5]

Using PXRF to Distinguish American and English Redware

Past PXRF studies on ceramics have determined that local chemical signatures of pottery can be determined and used to distinguish locally made wares from imported ones from other locations, even if the clay source or site of production was within a 50-mile radius. My study, in conjunction with the New York State Museum, would determine whether American-made redware from the eighteenth and nineteenth centuries could be distinguished from English and Dutch redware from the same time period. At the time of submitting this abstract, no PXRF has been completed for the project, save for various literary readings on the subject. However, based on those readings, it may be possible to use PXRF on redware from colonial sites in Northeastern America to provide a basis for determination between American and European made ware. Redware was a very common item being used at the time and was made locally and imported en masse. The results of this study could potentially be used in the field and in a museum collections context to further catalogue and study artifacts that otherwise would go undetermined, as the country of origin of many redware sherds, such as in the NYSM, is undetermined.

Cruz, Heather (University of Connecticut, Hartford)
[13]

Cult-ure during the Terminal Archaic? An Homage to Brian Jones

Broadspear cultures of the Terminal Archaic in southern New England are largely identified by the stylistic qualities and lithic choices of their projectiles. These diagnostics are likely variants of the Savannah River point of the southern U.S. region, which traveled north along the Atlantic Slope via the migrations of people and their technologies or the diffusion of technological industries through socioeconomic systems. Jones argued that the cultural and technological similarities witnessed along the coast were a deliberate display of peoples'/families' participation within a larger cult system. This system was headed by higher ranking groups/families who either controlled the locations where commodities could be collected or the central places where commodities were exchanged. In theory, a tiered system developed where local trade became nodes within larger regional networks, which in turn fed an interaction sphere covering most of the Atlantic Slope. Cults have been known to grow in conjunction with political systems because they promote 'sameness' and bind members through cooperation, morals and identities. Climatic changes and increased sedentism may have created a social atmosphere where membership within a socio-economic cult provided people physical protection, necessary dietary resources, and an opportunity to increase their own prestige.

Cruz, Krysten [35] see Cook, Jacob

Cruz, Ricardo [133] see Barba, Luis

Cruz Jiménez, Ricardo Leonel**[133]***Aspectos de aprovisionamiento y uso de la obsidiana en Chicoloapan Viejo, un asentamiento del periodo Epiclásico*

A partir del estudio morfo-tecnológico de la obsidiana, se discuten aspectos de vida comunitaria en el sitio de Chicoloapan Viejo durante su ocupación epiclásica. De esta manera se busca incrementar los conocimientos, con los que contamos, respecto a subsistencia doméstica y corporativa del asentamiento. Así mismo se exponen planteamientos preliminares respecto al aprovisionamiento y acopio de este material, tanto en el sitio, como en la Cuenca de México, partiendo de análisis de procedencia mediante la técnica de Fluorescencia de rayos X. Se propone un panorama general referente a las rutas de comercio y acopio de la obsidiana, desde los inicios del período Epiclásico.

Cruzado Carranza, Elizabeth (Louisiana State University)**[184]***Education and Cultural Heritage Preservation in Rural Peru: Lessons from Nivín, Casma*

This paper explores the past, present and future challenges of educational archaeology in Peru using as a case study my involvement with the Maria Parado de Bellido School in Nivín, Casma. Since 2011, collaborative efforts of teachers and students at the school and its own museum have led to the creation of a safe space to engage with the local past by establishing connections between archaeologists, both Peruvian nationals and foreigners, and local educators and community members. Teachers and archaeologists have created a series of lesson plans that use the ancient cultural materials and practices in multidisciplinary learning activities. In a co-creative effort, we have developed educational activities, in which all students can learn about diverse topics, including art, social studies, and sciences. Students particularly enjoy the creative and visual arts activities because these are hands-on lessons about ancient forms of artistic manifestations. Because these activities occur in the school and museum that share the same building complex, the community also has the opportunity to engage and learn about their cultural heritage. This paper presents the complex and rich entanglements between those various audiences and social actors in the Nivín community.

Cuello del Pozo, Paloma (Texas A&M University), Jose Peña (University of South Florida) and J. Eduardo Eche Vega (Universidad Nacional de Trujillo)**[105]***Preliminary Analyses of Archaeological Pollen from the Casma Site of El Campanario, Huarmey, Peru: A Cautionary Tale for Archaeologists*

Our exploration focuses on issues regarding archaeological palynology and present a case study using a preliminary set of pollen samples from El Campanario Archaeological Project in Huarmey, Peru. The majority of the samples used in this analysis were obtained from an architectural platform, which has been C14 dated to 1150–1280 AD. The prevailing hypothesis suggests the site was occupied by the Casma people. This project has revisited Bryant and Hall (1993), who published a set of protocols showing the potentials and problems of palynological analyses in archaeology. We use our preliminary set of samples to discuss issues and advantages when applying this method; in archaeological layers, the preservation of paleobotanical micro-remains is often poor, which poses an obstacle during taxonomic identification. Hence, we have limited our discussion to presence/absence data of pollen families recovered to date at the site. Some of the most common identifiable grains in El Campanario include maize and some members of the legume family. The findings of these cultivars within occupational layers of this platform provide some hints to archaeologists as we try to understand the cultural activities that could have been performed during the occupation of the site.

Cuello del Pozo, Paloma [242] see Chavez, Mark

Cuello del Pozo, Paloma [242] see Ritter, Alexandra

Cuevas, Mauricio [227] see Budar, Lourdes

Culleton, Brendan [237] see George, Richard

Curet, L. Antonio (National Museum of the American Indian, Smithsonian Institution)**[169]***Life and Death at the Ceremonial Center of Tibes, Ponce, Puerto Rico*

For a long time, the ceremonial center of Tibes has been considered by many archaeologists as evidence of incipient social stratification and monopolization of power in the Caribbean. However, a long-term project at this site has failed to find clear evidence of strong social differentiation and has forced us to begin explaining either the presence of social stratification without archaeological correlates or the development of a monumental, ceremonial center without social stratification. This paper takes a closer look at the premises and evidence (or lack of evidence) recovered by the project and propose a new perspective that may explain the contradictions presented above.

Cureton, Travis [79] see Phillips, Bruce

Curliss, Lydia (Brown University Libraries)**[41]***Collaborations between Academic Libraries and Archives for the Support of Indigenous Archaeology and Cultural Resource Management*

Academic libraries and archives currently partner with researchers and communities on scholarship and research centered on indigenous people and topics, including but not limited to digital storytelling, reclamation of language and archival projects. In the context of indigenous archaeology and cultural resource management, libraries and archives have the potential to be key partners in sustaining and building scholarship and research efforts. This presentation will address the ways in which librarians and archivists are uniquely positioned to be integral resources, and the areas in which their expertise directly relates, such as knowledge of GIS, digital scholarship and collections management. Additionally, it will consider some of the challenges libraries and archives face in successfully supporting research and scholarship, and the ways in which these partnerships are beneficial to increased advocacy and support in the work of indigenous archaeologists and the communities they collaborate with.

Curti, Giorgio Hadi [127] see Dongoske, Kurt

Cusicanqui, Solsiré (Harvard University)

[106]

Identity through Movement: Domestic Political Units and Pan-Andean Relations in Prehispanic Cajamarca

The purpose of this project is to investigate the relationship between environmental factors and cultural dynamics as manifested in the development of specialized pottery production as a symbol of ethnic identity in the valley of Cajamarca, Peru, during the Early and Middle Cajamarca Periods (cal 100 BC–850 AD). To that end, this work will examine the idea of ethnicity and communities of practice in the Andes. First, we propose how ethnicity is generated and maintained, emphasizing certain cultural features (e.g., pottery, architectural patterns, goods, mobility, funerary practices). Second, we will evaluate how this ethnic identity is a product of belonging to a community that is built through the participation of its members in the practices and activities of this society. We will cover the internal and external dynamics of this sociocultural group, focusing on cultural remains and their distribution in different functional spaces registered to date. Our work is based on the excavations of two archaeological sites of the Cajamarca period: Iscocongá and Carambayoc. We will present the results of three field seasons in both archaeological sites that present pottery production areas, houses, ceremonial and, possibly, administrative spaces.

[106]

Chair

Cyphers, Ann (IIA-UNAM)

[191]

Palace Sculpture of the San Lorenzo Olmec

Palaces never fail to fascinate us. Religious and political meanings embedded in these paradigms of luxury, wealth, and power built on a majestic scale support the rulers' ascent to power and right to a privileged life. The earliest known Olmec palace and its complex at San Lorenzo, Veracruz, shows the incorporation, use, and display of sculpture as architectural, commemorative and symbolic elements that proclaim legitimacy through ancestral and divine associations, as is evident in later palaces.

Cyr, Howard [222] see Nelson, Erin

Dacus, Chelsea (Museum of Fine Arts, Houston)

[141]

Rayed Gods and Llamas in Tiwanaku Metalwork: An Exploration of Two Common Motifs in Middle Horizon Visual Culture

The Tiwanaku, a culture that helped define the Middle Horizon Period of the ancient central Andes, has been well-studied for its monumental stone sculpture and architecture. Other aspects of its visual culture, however, have experienced a dearth of research, most especially its metalwork. Two common motifs in Tiwanaku art, the rayed deity face and llamas, are particularly prominent in Tiwanaku works of gold and silver. The importance of these motifs has been recognized in the mediums of stone and fabric, but their meaning and relationship has yet to be satisfactorily explored. Terrence Grieder believed that interpretation of symbols in the art of ancient cultures could be accomplished through a careful balance of configurational analysis and ethnological analogy tempered by an awareness of the disjunction of meaning over time. Grieder's methodology has been refined in recent scholarship into a more comprehensive examination of visual culture, encompassing multiple disciplines and aspects of cultural production as communication. Utilizing this expanded method of research, this paper will investigate the meaning of the motifs of rayed deity and llama in Tiwanaku metalwork.

Dagtas, Nihan [244] see Singleton, Robin

Dakovic, Gligor (University of Pittsburgh)

[35]

Long-term Social Processes and Demographic Dynamics of the Early Bronze Age (2800–1700 BC) in the Northern Banat Region of Serbia

This program of research examines long term social and economic transitions and associated developments in settlement patterning, regional demographic processes, and centralized control of natural and cultural resources. Archaeological field research will be undertaken in the Banat region of Northern Serbia, located in the Carpathian Basin of Europe, where it appears that egalitarian communities gave way to completely new forms of hierarchical social organization by the early second millennium BC. This field research takes aim at these current gaps in knowledge in order to generate an important new multi-scalar dataset to better interpret diachronic changes in these late prehistoric communities and to examine the organization of populations across the

landscape in relation to increased economic and political centralization and control of resources.

Dale, Jedidiah (Department of Geography and the Environment, The University of Texas at Austin), Timothy Beach (Department of Geography and the Environment, U), Sheryl Luzzadder-Beach (Department of Geography and the Environment, U) and Colin Doyle (Department of Geography and the Environment, U)
[206]

Integrating Lidar with Hydrographic and Hydraulic Data to Better Understand Long-Term Human Interaction with the Rio Bravo Watershed

Lidar has provided revolutionary data for studying geomorphic processes in tropical forests such as those of northwest Belize. This includes an expanded understanding of anthropogenic interactions, both past and present, with fluvial systems. However, lidar alone is limited in its ability to study fluvial dynamics, especially in regions with sparse hydrologic data. Spatially variable parameters, well studied in geomorphology, such as discharge, channel morphodynamics, and woody debris, are important for investigating ancient Maya interaction with watersheds. Diverse research interests including water availability, flood resiliency, and river network navigability, could all benefit from improved hydrologic data. Here, we present new data collected along the archaeologically rich Rio Bravo. We collected bathymetry and channel geometry with down-nadir sonar, and woody debris concentrations with side-scan sonar. Additionally, we used an Acoustic Doppler Current Profiler to collect velocity profiles and discharge, from which we make the first estimate of dry season base-flow on the Rio Bravo of 6–7m³s⁻¹. This work complements, and will be combined with, ongoing lidar and multiproxy investigations of ancient Maya agriculture and water management. Integrating these diverse datasets allows us to expand our quantitative study of the dynamic hydrologic interactions of Maya land use with fluvial systems.

Dale, Jedidiah [4] see Erickson, Clark

Dale, Jedidiah [206] see Luzzadder-Beach, Sheryl

Dalmas, Daniel [236] see Rapes, John

Dalmas, Daniel [233] see Somerville, Andrew

d'Alpoim Guedes, Jade [267] see Garvin, Arianna

d'Alpoim Guedes, Jade [205] see James, Nathaniel

Dalton, Jordan, Colleen O'Shea (Fine Arts Museums of San Francisco), Juliana Gomez Mejia (Universidad de Caldas, Colombia) and Noemi Oncebay Pizarro (Universidad San Luis Gonzaga de Ica)

[21]

Death after Inka Expansion: Analyses of a Secondary Communal Burial at Las Huacas, Chinch Valley

This paper presents new research from the site of Las Huacas in the Chinch Valley of Perú. The Proyecto de Investigación Arqueológica Las Huacas (PIALH) has been conducting research on Complex N1 at the site of Las Huacas since 2016. Complex N1 contains Inka architectural features and was modified during the Late Horizon (AD1470–1532) and likely the early Colonial Period (1532–1570). Within a room in Sector A of Complex N1, PIALH found a large mortuary feature known as Feature 17. Feature 17 contains at least 38 individuals that show features of secondary mortuary rituals, including crania painted with red pigment. This paper shares details from analyses of textiles, ceramics, human remains, and other artifacts included in the mortuary feature. These analyses shed light on both the individuals whose remains were deposited in Feature 17, as well as the rituals that surrounded their reinterment at Complex N1. The paper concludes by discussing what Feature 17 tells us about the terminal Late Horizon and/or early colonial period mortuary practices, as well as the larger sociopolitical contexts that surrounded the reinterment of these individuals.

Dalton, Jordan [21] see Larios, Jennifer

Dalton, Kevin [188] see DeGeorgey, Alex

Dalton, Sara

[163]

At the Gates of Xibalba: The Chultunes of El Mirador

Subterranean chambers known as chultunes exist in great numbers in sites throughout the Maya world, the Mirador Basin of northern Guatemala being no exception. However, the function of these structures has yet to be fully understood, with a variety of uses having been proposed over the last 130 years. In an attempt to ascertain the function and purpose of the chultunes of El Mirador, a number of these structures have been excavated, with an assortment being selected from both elite and residential areas. This paper presents the latest findings in the ongoing excavation and analysis of these chambers, with an additional focus on multiple burials found in one elite Preclassic chultun, and discusses possible alternative uses for these chultunes.

Damick, Alison (University of Texas, Austin) and Arlene Rosen (University of Texas, Austin)

[171]

What Is at Risk? Arid-Land Management Strategies by Hunter-Gatherers to Increase Plant Resource Potential in the Archaic Period, Northern Rio Grande

The Middle to Late Holocene (ca. 7000–1000 BP) in northern New Mexico is characterized by a transition from a dry, arid climate to

a significantly cooler, wetter one. This transition is sometimes considered one impetus for the beginning stages of cultivation and eventually early farming by the Archaic hunter-gatherer populations in this area. Given the drive to understand the origins of farming and adoption of popular staple cultigens (particularly maize), there has been much less research on how the landscape of that time looked, water resources, and the range of wild plants that were available. This paper presents new geoarchaeological and microbotanical data from alluvial sections along the northern Rio Grande, northeastern New Mexico, that suggest that Archaic occupants engaged in complex management of wild plant and water resources to increase food resource potential in the landscape, and mitigate the risks of living in an arid environment. This occurred long before the advent of early farming. The delay in the adoption of maize agriculture in this area suggests that these risk minimization strategies might have outweighed the risks incurred by maize farming until other social factors came into play.

[171]

Discussant

[171]

Chair

Damour, Melanie (Bureau of Ocean Energy Management), Douglas Jones (Bureau of Ocean Energy Management), Warren Wood (U.S. Naval Research Laboratory) and Leila Hamdan (University of Southern Mississippi)

[18]

Exploring Deepwater Shipwreck Microbiomes in the Northern Gulf of Mexico: The Microbial Stowaways Project

Shipwrecks have long been known to serve an important role as artificial reefs for macrofauna such as corals, crustaceans, and fish. However, recent research in the Gulf of Mexico is revealing that historic shipwrecks also influence marine microbial dispersal and seafloor biogeography. Microorganisms play a key but poorly understood role in biofilm formation, wood degradation, and metal corrosion in the deepwater environment, which influences artificial reef formation and, ultimately, archaeological site preservation. The 2019 Microbial Stowaways Project, an interdisciplinary scientific collaboration between BOEM, USM, and the NRL and funded by NOAA's Office of Ocean Exploration and Research, is exploring how wooden-hulled shipwrecks shape the dispersal of microorganisms in the deepwater Gulf. Two previously unexplored nineteenth-century shipwrecks (at 525 m and 1,800 m water depth, respectively) were investigated in 2019 to develop baseline archaeological characterizations, deploy arrays of in situ biofilm recruitment experiments, and collect sediment samples at varying distances from the shipwrecks to identify a microbiome signature (e.g., microbial taxa associated with shipwrecks, elevated diversity). In addition, a machine learning component is developing a computational tool that may be used to detect where shipwrecks are present by examining microbiome data from areas lacking archaeological data.

[18]

Chair

Damour, Melanie [18] see Horrell, Christopher

Damp, Jonathan

[257]

A Simple Solution to the Problem of the Origins of Settled Life and Ceramic Production: A View from Coastal Ecuador

Initial attempts to explain the origins of pottery on the coast of Ecuador and in the rest of the Americas focused on trans-Pacific contact. During the last few decades this debate quieted as the Vegas and Valdivia phases of southwest Ecuador became better known. Nevertheless, there remains a chronological hiatus between the two phases. Demographic and settlement data is combined with geoarchaeological interpretations of the mid-Holocene record to demonstrate how simple demographic growth combined with geomorphological changes of the coastal landscape yielded modifications in settlement patterns, growth of settlements, and a transition in social organization that led to the production of pottery and the creation of early villages.

[257]

Chair

Daniels, James (University of California, San Diego and ASM Affiliates Inc.), Heather Thakar (Texas A&M University) and Hector Neff (California State University, Long Beach)

[237]

Reaping the Rewards of Incipient Agriculture from the Land to the Sea and the Mangroves In-Between

During the Archaic-to-Early Formative transition in the Soconusco, populations began adopting more sedentary subsistence strategies and investing more in their local environments. Evidence from sediment cores demonstrate that during the Archaic period, populations were burning inland landscapes and starting to grow maize. The environmental effects of incipient agriculture along the coastal margins of the Soconusco are addressed in this study by examining pollen from sediment cores, changes in diet, and the evolution of the barrier beach. These lines of evidence point to a rather sudden change in the coastal environment during the transition from the Archaic to Early Formative. Environmental changes caused by incipient agriculture included the expansion of the mangroves along the eastern Soconusco coast allowing Early Formative occupants to diversify their subsistence strategies through the exploitation of the biodiversity offered by an expanded mangrove estuary along with continued interior cultivation. The abundance of resources provided by the mangrove-estuary zone supplemented by maize agriculture were primary factors in the establishment of sedentary village life in the Soconusco as local environmental investments and technologies allowed initial Early Formative inhabitants to maximize their energy returns.

Dansie, Amy [198] see Jerrems, William

Darby, Melissa**[56]***Zelia Nuttall and Drake's Dream*

In 1886 Zelia Nuttall began work at the Peabody Museum for Ethnology and Archaeology under the tutelage of Frederic Putnam. Nuttall became a specialist in precolumbian Mesoamerican cultures and conducted archaeological fieldwork in Mexico for the Peabody, where she was "Honorary Assistant in Mexican Archaeology," an unpaid post which she held for 47 years. She lectured at major conferences and universities in the Americas and Europe and wrote articles for prestigious journals. She traveled throughout the world to collect archaeological and ethnological specimens for museum collections, as well as for a select group of wealthy patrons including Phoebe Hearst. With Hearst's assistance, she was one of the founding members of the Department of Anthropology at UC Berkeley, where in the early years of the department she was a field director of archaeological research in Mexico. Her major contributions to the field of anthropology are classics: *The Nuttall Codex*, *The Island of Sacrificios*, and *The Fundamental Principles of Old and New World Civilizations*. Her findings on the location of Francis Drake's fair bay on the west coast were eclipsed by Drake's Plate of Brass land claim, a hoax which was likely created by a famous history professor, her nemesis.

Dashzeveg, Bukhchuluun (Yale University), Lisa Janz (Trent University) and Odsuren Davaakhuu (Mongolian Academy of Sciences)**[62]***Use and Reuse of Burial Space during the Late Bronze Age and Early Iron Age in Mongolia: A Case Study from Zaraa Uul*

During the late second millennium BC, communities in the Gobi-steppe of Mongolia began to build unique burial structures made of stone. The Late Bronze Age builders of these mortuary features employed new forms of surface demarcation and for the first time in this region, individuals were interred in a prone position. At the turn of the millennium, this prone tradition was replaced by subsequent 'Slab Burial' mortuary culture. In recent years, Archaeologists working in Mongolia have increasingly focused on this transition to the Early Iron Age because this period is crucial in the development of social and political complexity, horseback riding, and long-distance trade and exchange. This paper presents the results of recent excavations at Zara Uul in eastern Mongolia. The data generated from this project sheds new light on the transition the two periods through the documentation of the use and reuse of burial space during the Early Iron Age.

Dashzeveg, Bukhchuluun [62] see Cameron, Asa

Davaakhuu, Odsuren [62] see Dashzeveg, Bukhchuluun

Davidson, Jaron**[267]***Long-Distance Interaction in Viejo Period Casas Grandes*

This research attempts to answer how interregional interaction changed between the Viejo and Medio time periods in northwest Chihuahua, Mexico. Using geospatial analysis, I compile all known information about non-locally produced artifacts, architecture, and iconography from Viejo period contexts. This includes evidence such as foreign pottery, turquoise, and marine shell. The data are then compared to similar evidence from the Medio period in order to better understand what transitions may have occurred in the interaction networks, and how these transitions may have contributed to the social changes that coincided with the rise of Paquimé. This geospatial data reveals evidence of continuity and change during a time of increased social and political complexity.

Davis, Caitlin (Yale University)**[150]***Within the Mangrove Swamp: Formative Obsidian Exchange at Salinas La Blanca, Guatemala*

Salinas La Blanca was an early sedentary community located within a mangrove swamp of the fertile Soconusco region of Guatemala. Obsidian sourcing indicates that Salinas La Blanca was involved in an extensive trading network by 1200 BC, receiving obsidian from multiple sources hundreds of kilometers away. The access to some sources present at Salinas La Blanca, such as El Chayal, is thought to have been mediated by elite communities, thus placing Salinas La Blanca within a network of economic and social relations. The participation of this newly sedentary hunting and gathering community within this international system, as well as the appearance of blades in the lithic assemblage, parallels evidence of emerging social complexity at larger regional centers like La Blanca and Ujuxte. Considered in broader context, the Formative obsidian assemblage of Salinas La Blanca speaks to the widespread nature of regional trends in Pacific Coastal Guatemala.

Davis, Christopher (University of Illinois at Chicago)**[127]***Whispers of a World That Was: South American Animism of the Amazon-Orinoco Basins*

Several South American cultures appear to have established world views based on associative observations of natural cycles, whereas connections are remembered through various mnemonic and recall devices like song, dance, rock art, architecture, myths, ritual, and festival. While modern science focuses on an essentialist truths (identifying the psychoactive chemical as the essence of a drug, for example), South American animism among many groups focused on associations—identifying the conditions accompanying desired outcomes. The result was to see things through relationships, making them observant of the natural world interacting with each other, not just with humans. I present three ways in which the whispers of a world that was envisioned this way had endured the ravages of time in South America. The first is through the form of rock art pictographs in the Lower Amazon used to label caves by its chief animal resident personified in paintings. The second is through the form of myths from the Orinoco River that

recount the procession of animal fire bearers passing the firebrand torch in the Watunna folktale. And the third is through ethnoastronomy portraying the zodiac constellations as the animals that match the paramount sounds of the nighttime seasons.

Davis, Jera (New South Association Inc.), Stephen Carmody (Troy University) and Jon Russ (Rhodes College)

[211]

Pipes, Plants, and Practitioners: Change and Continuity in Religious Ritual at Moundville

Religion likely played an important role in the establishment of the Mississippian Moundville polity in the Black Warrior River valley, and it remained a primary driver of social and political change over the ensuing centuries. Smoking pipes hold considerable potential for understanding the role of religious ritual in Moundville society but have only just begun to receive more than passing attention. Recent gas chromatographic/mass spectrometric (GC/MS) analyses of residues scraped from Late Woodland and Mississippian pipes found in the Black Warrior Valley have detected a variety of compounds, implying that ritual practitioners took advantage of an extensive inventory of plant medicines. Using this evidence, this paper explores the shifting character and structure of Moundville's religious orders over several centuries of historical change.

Davis, Jera [63] see Tolan, Grace

Davis, Joshua [25] see Bement, Leland

Davis, Kaitlyn (University of Colorado, Boulder)

[239]

Pueblo Agricultural Adaptations to Socioeconomic Changes in New Mexico

This presentation illustrates the results of the survey work of the agricultural areas around two pre-contact villages (Poshuouinge and Pueblo Blanco) and two contact-era villages (Cuyamungue and San Marcos). One-hundred-fifty-six (156) agricultural features were documented on the survey. These features ranged from Pueblo irrigation ditches in and slightly above the floodplains to raised gravel mulch fields on upland ridges above the villages. Analyzing the changes in the location, type, size, and density of these features before and following contact enable a better understanding of Pueblo agricultural adaptations over time and the extent to which Spanish plants, animals, and agricultural methods were incorporated into Pueblo agriculture. This survey work is part of a larger project investigating how (and to what extent) Pueblo people in the Rio Grande region of New Mexico adjusted their agricultural practices when confronted with Spanish colonization. The project consists of 1) developing agricultural potential models to identify where the optimal growing areas likely were, 2) surveying the areas around multiple pre-contact and contact-era Pueblos to document agricultural features and any changes in those features or technologies with colonization, and 3) analyzing sediment samples to determine the types and density of plants grown in the fields.

Davis, Loren (Oregon State University)

[170]

Late Pleistocene Occupation at the Cooper's Ferry Site, Idaho: Questions and Answers

Radiocarbon dating at the Cooper's Ferry site in western Idaho indicates that people repeatedly occupied the Columbia River basin, starting between 16,560 and 15,280 cal yr BP and continuing to ~13,000 cal yr BP. The site's occupants employed unfluted stemmed projectile point technologies before the appearance of the Clovis Paleoindian tradition. Technological patterns seen in the Western Stemmed Tradition here support early cultural connections with northeastern Asian Upper Paleolithic archaeological traditions. The Cooper's Ferry site was initially occupied during a time that predates the opening of an ice-free corridor ($\leq 14,800$ cal yr BP), which supports the hypothesis that initial human migration into the Americas occurred via a Pacific coastal route. We review the record and address several misconceptions about the site.

Davis, Loren [195] see Carroll, Sean

Davis, Loren [170] see Des Lauriers, Matthew

Davis, Loren [238] see Dixon, E. James

Davis, Mary, Lucas Martindale Johnson (Far Western Anthropological Research Group), Daron Duke (Far Western Anthropological Research Group), Elsa Carpenter (Far Western Anthropological Research Group) and Lee Drake (Decision Tree LLC)

[5]

Very Small Rocks: Exploring Specimen Size Limits in Trace-Element Analysis of Obsidian Flaked Stone with Portable X-Ray Fluorescence

Archaeologists continue to push the limits of non-destructive X-ray fluorescence (XRF) analysis in efforts to geochemically source small obsidian artifacts. Building on numerous prior investigations, this study examines a statistically large sample of unmodified obsidian flakes to better define the size threshold for acceptable precision and accuracy, and to test the use of a source library that includes small samples. Using traditional flintknapping methods, 1,200 flakes were made from three geochemical obsidian sources: Casa Diablo, Bodie Hills, and Buffalo Hills. Specimens ranged from very small pressure flakes to large interior flakes and were intended to replicate the size and morphological variation typical of an archaeological assemblage. The specimens were analyzed on two Bruker handheld pXRF units, the Tracer III-SD and the 5g. Statistical analyses and computing algorithms were used in an effort to quantify the size limits of non-destructive analysis and to create source confidence regions that include small samples.

Davis, S. R.

[192]

A Brief Introduction to the North American Gunflint Database Project: A New Tool for Historic Period Archeologists

A comprehensive, open-access, cloud-based database for collecting, filtering and analyzing gunflint attribute information is being developed with the objective of promoting higher quality, more enlightening research into the use, manufacturing technology, morphology, and distribution of gunflints in the New World. Currently in beta-testing in a digital spreadsheet format, the database will eventually be converted into a sophisticated, searchable Sequel database housed in the cloud and freely accessible supporting all researchers wishing to perform comparative analysis or adding their gunflint collections. Currently the database is collecting 40 bits of site information and up to 55 bits of attribute data for each artifact. When the database "goes live" in late 2020 or early 2021, the database will potentially contain data from 2,000 or 3,000 gunflints recorded during the beta-test phase; itself a valuable dataset for the researcher. The database is designed to grow "organically" through the continuing input from researchers, museums, and historic sites collections throughout the targeted region and potentially the entire Western Hemisphere. Collaboration is welcome and encouraged.

Davis-King, Shelly (Davis-King & Associates)

[58]

Who Wudda Thunk CRM Could Be Profitable? One Woman's Desire to Put Culture into Cultural Resource Management

The 1970s saw the rise of public or salvage archaeology that had little, but required formal structure. By the mid-1970s, Cultural Resource studies were so-named and developing, followed soon by established businesses providing CRM investigations. This paper will discuss a holistic approach to CRM in those early days, and one which embraced all of the cultural history of an area, including Native American partnerships, description of the built environment, and historical native and nonnative archaeology. It will also discuss the challenges of being a one-person shop, being a female in the business, and being largely an anthropologist/ethnographer rather than an archaeologist. It will provide some perspective on 50 years of business.

Dawson, Emily (University of Texas, Austin)

[125]

Discussant

[125]

Chair

Dawson, Emily (University of Texas, Austin)

[171]

Risk and Resilience on the Colonial Frontier in New Mexico

The seventeenth century in New Mexico was marked by series of droughts, making an already semiarid environment even more risky for agricultural activities. Newly arrived Spanish colonists had to contend with these periodic droughts, while also adapting their agricultural practices to the New Mexican landscape. Early accounts by Spanish colonists in New Mexico indicate that they brought a range of Old World cultivars with them, including wheat, barley, lentils, melons, and garlic. While these accounts suggest the colonists were growing the cultivars, archaeological work has produced only limited evidence for the growth and use of Old World plants throughout the region. Instead of depending on Old World cultivars, the colonists are thought to have relied heavily on indigenous communities for the production of foods, including wild foods. This paper examines phytolith evidence from a seventeenth-century rancho in New Mexico in order to understand risk management strategies by Spanish colonists. I present preliminary data for the use of native New World plants, especially wetland species, as well as agricultural activity during the turbulent seventeenth century.

Day, Peter, Richard Jones (University of Glasgow, UK), Maria Rosaria Manunza (Selargius Excavations, Sardinia), Alessandro Usai (Soprintendenza Archeologia, Belle Arti e Paesaggio) and Lucia Vagnetti (CNR, Rome)

[196]

Reverberations of the Aegean? Italo-Mycenaean Pottery and Nuragic Sardinia

Mycenaean ceramic imports on Sardinia, along with copper ingots, form the epicenter of a heated debate over 'minimalist' and 'maximalist' models of the Aegean presence on the island, somewhat of a colonialist distraction as to what is really going on in the island at this time. Outside of key coastal centers, these imports are few in number and certainly not as indicative as the movement of Nuragic pottery within the island that is being documented. Their ceramic cousins, a range of pottery which feature Aegean shapes and decorative painted motifs occur in rather large numbers in two major sites, on the Bay of Cagliari: Nuraghe Antigori and the recently excavated site of Selargius. This stylistically 'intrusive' pottery has been studied in a major programme of analyses, along with all other pottery types in a total-assemblage approach which details the fabrics, probable production centers and production technologies of these very characteristic wares, comparing them with the well-known Nuragic dark-burnished range of vessels. The results show a blurring of the borders between long established ceramics categories, where Aegean-style pottery is locally produced, with intrusive, wheel-based forming techniques, yet often subjected to open firing and sharing clay sources with ceramics characterised as Nuragic.

[196]

Discussant

[196]

Chair

Day, Peter [196] see Kilikoglou, Vassilis

de Anda, Guillermo (Instituto Nacional de Antropología e Historia), Ana Celis and Karla Ortega**[137]***Ritual Termination of Balamkú at Chichen Itza*

Balamkú was reported to INAH in 1966 but the cave entrance was buried without further investigation. Fifty years later, the Gran Aquifero Maya rediscovered Balamkú in 2018 and initiated an archaeological study of the site whose assemblage closely resembles that of Balankanche. Like Balankanche, Balamkú is surrounded by structures and connected to Chichen Itza by a sacbe, confirming its status as a politically important complex. Work during the 2019 season confirms that the cave was ritually terminated in antiquity by filling the first two chambers with stone. It is believed that this event may date the fall of Chichen Itza.

De Andreis, Sonia**[246]***Étude technologique des assemblages céramiques de Ciudad Perdida: Quels apports?*

Cette présentation se propose de questionner les apports de l'étude technologique et plus particulièrement de l'étude des chaînes opératoires céramiques dans la caractérisation des groupes sociaux de la Zone Tairona dans la synchronie et la diachronie. En se basant sur un exemple précis, l'étude de plusieurs unités fouillées par Santiago Giraldo (2010) sur le site Buritaca 200—Ciudad Perdida, il s'agira d'interroger les contributions de cette méthode, jusqu'ici non appliquée dans la région, à la compréhension de la composition sociale du site à l'époque Tairona, ainsi que de l'origine de ses habitants. Quelles sont les chaînes opératoires observables à Ciudad Perdida aux périodes Tairona et Neguanje ? Que peuvent-elles nous apprendre sur les habitants du site aux deux périodes? Dans quelle mesure l'étude des techniques peut-elle permettre une relecture de la culture matérielle de la zone Tairona? Ces questions sont autant de pistes de réflexion que nous essayerons de développer.

De Caro, Alex [18] see Delgado, James

De Dufour, Karyn**[217]***Discussant***de Gruchy, Michelle (Durham University)****[33]***Mobility Patterns across Mesopotamia from the Fourth to First Millennia BC*

More than 12,000 segments of preserved hollow ways/routes have been documented across both northern and southern Mesopotamia. When combined with the many documented water channels in southern Mesopotamia and the rivers across Mesopotamia known to have been part of the transportation network of the region, Mesopotamia becomes one of the best preserved and documented archaeological landscapes of past mobility. This presentation will (1) introduce the new hollow ways from southern Mesopotamia and (2) pull apart the palimpsest of route features across the wider Mesopotamian landscape in order to present a current, diachronic picture of the traffic patterns across ancient Mesopotamia from the fourth to first millennia BC, as they are preserved in the archaeological record.

de Guzman, Margarita, Amanda Wong (Circle CRM Group Inc.) and Kristin McKay (Circle CRM Group Inc.)**[183]***Managing Spatial Data for Large-Scale Forestry Management Areas in Alberta*

In April 2014, the Historic Resources Management Branch (HRMB) of Alberta Culture (now renamed a longer and more complicated ministry) issued Survey and Excavation Spatial Data Standards, which meant that consulting archaeologists in Alberta now had to submit shapefiles representing their project footprint, ground survey, and any subsurface work (shovel tests, excavation units, etc.) associated with Historic Resource Impact Assessments (HRIAs). For large-scale projects such as HRIAs associated with Forestry Management Areas, the additional post-field work required to complete and manage this task equated to additional weeks of man hours. Five years later, managing spatial data is a simple and standard task, with the help of a GIS Specialist and improved processes. This short demonstration will highlight the steps for efficient management of this data, from collection in the field to submission to the HRMB.

de la Peña, Paloma [11] see Val, Aurore

de la Rosa, Yuri (Centro INAH Coahuila), José Concepción Jiménez (Dirección de Antropología Física del INAH), María Rodríguez Ceja (Laboratorio de Espectrografo de Masas de la UNAM), Miguel Martínez Carrillo (Laboratorio de Espectrografo de Masas de la UNAM) and Eva Salas Bautista (Dirección de Antropología Física del INAH)**[101]***La Cueva de las Cornamentas: Cuatro Ciénegas, Coahuila*

The Cuatro Ciénegas Valley in Coahuila is exceptional in many ways, mainly known for its pools in the middle of the desert and its endemisms, but its archaeological remains are as surprising as its biodiversity. The Cave of the Antlers is a mortuary cave where a large amount of archaeological material was found, which is found in the House of Culture of Cuatro Ciénegas. Thanks to various situations such as the collaboration with the Project of the Early Man in México, the theft of pieces from the archeology room and a remodeling of the aforementioned site, we have made new studies and dates of the cave and the material in question with very interesting results with temporalities close to 4000 years BP.

de la Rosa-Díaz, Jesús (University of Zacatecas, México.)**[67]***Valle de Bonanza (Zacatecas, México): A limestone lithic assemblage*

The valley of Bonanza, located in the northeast of the Mexican state of Zacatecas, is a surface-only archaeological site placed in the outskirts of the Chihuahua's desert in a landscape heavily affected by erosion. In the site, a considerable number of lithic artifacts have been discovered sitting in punctual concentrations brought to light by deflation and altered by the formation of a thick cap of desert varnish. In the assemblage, the major part of the artifacts are made of limestone and other large-grained sedimentary rocks, in which we have identified a technology of informal stone tools based principally on transversal flakes and bladelets. In this poster, we discuss the probable reasons for the choice of a raw material that is so uncommonly used for lithic manufacture, and about the taxonomic types within the assemblage and their probable uses.

de Leon, Monica [130] see Vepretskii, Sergei

de los Ríos, Gabriela [106] see Matsumoto, Go

De Lucia, Kristin (Colgate University) and Enrique Rodríguez-Alegría**[239]***The New Water-Mountain: Archaeology of a Colonial Church in Xaltocan, Mexico*

Archaeology in colonial churches in large cities, such as Cholula and Mexico-Tenochtitlan may give the impression that the Spanish aggressively built churches over temples and politico-religious architecture as a symbolic form of domination; however, recent research at Xaltocan, Mexico, shows that they may have used different tactics in this rural, hinterland community. In Xaltocan, the colonial church was built in a space that was not occupied during the Late Postclassic (AD 1350–1520) period. Yet, is it possible that this space may have held ritual significance to Xaltocan's native inhabitants? Recent excavations in the atrium of the sixteenth-century church in Xaltocan have revealed new insights into religion and ritual during the early colonial period.

de Lucio, Oscar [20] see Alonso, Alejandra

de Marigny, Elizabeth (University of Texas, Austin)**[108]***Copyright CAMAL: The Use of Pot Marks as Trademarks on Late Iron Age Storage Vessels in the Littoral Northwest Region of Iberia*

Various methods of ceramic analyses have been used by archaeologists to better understand past human behavior. Among such methods is the study of pot marks. As such, within Castro Culture scholarship pot marks have often been studied in relation to imported Roman materials like terra sigillata. However, such attention has yet to be paid to pot marks found on locally produced pottery. While Castro Culture scholarship has generated varying interpretations of pot marks associated with imported pottery, this paper will introduce the use of pot marks as trademarks for local potters. More specific, this paper will focus on locally produced storage vessels in attempts to better understand the effects of Roman conquest on local economies. Through an in depth analysis of one case study, this paper argues that some pot marks are communication devices employed to imply standardized and specialized production. This paper discusses the use of one pot mark found on storage vessels produced in workshops operated by the CAMALUS, a local and elite family. Such an examination will address the use of trademarks as an economic device used by potters in the littoral northwest region of Iberia during the Late Iron Age.

De Peña, Felicia [199] see Barket, Theresa

de Pozo, Paloma Cuello [240] see Kaul, Urvi

de Smet, Timothy and Morgan Smith (University of Tennessee, Chattanooga)**[238]***On the Use of Acoustics to Identify Submerged Anthropogenic Lithic Material*

Recent research has demonstrated that it may be possible to identify submerged anthropogenic lithic material remotely. The underlying principle of this method is that low-frequency sound waves resonate within lithic materials of an ideal shape. This resonance disrupts sound waves in a manner that can be consistently observed in SONAR profiles. These signals appear as "haystacks," which are wavy anomalies in the water column on SBP data. This paper builds off previous lab-based research on the topic with new data from acoustic modeling, geophysical data collection in the winter of 2018/2019, and initial field tests of the method conducted during the summer of 2019. First, three sites with known precontact lithic assemblages were scanned with an SB-424 instrument. All three sites exhibited the haystack features lithic artifacts are believed to produce. A subsequent survey of an area where no archaeological site was documented also produced haystacks. When this locality was investigated by divers, a small debitage scatter was identified, resulting in the discovery of a previously unrecorded archaeological site. These initial results are promising, but much more testing and refinement is necessary before this technique can be implemented on a broad scale.

Deacon, Janette [111] see McClintock, Thomas

Dean, Jake and Beth Scaffidi (Arizona State University)**[243]***Water Scarcity and Wari Imperial Expansion: Using Remotely Sensed (Planet) Data to Examine the Impact of Freshwater Availability on Imperial Settlement Strategies*

Freshwater availability is critical to human civilizations. Drought and flood events can lead to changes in settlement strategies, or require innovative water management techniques, particularly in the arid Andean coast. Some have suggested that the Wari Empire's prowess in hydrological management allowed them to colonize sites in distant lands (Glowacki and Malpass 2003; Williams 2002). Here we explore whether Wari imperial expansion around 500–600 CE was a response to drought and flood events of the Early Intermediate Period (200–750 CE). We compare water security at coastal Wari-administered sites ($n = 5$) to contemporaneous non-Wari sites ($n = 2$) to understand whether water assistance could have motivated Wari presence during the Middle Horizon (500–1100 CE). We predict Wari-administered sites experienced highly variable access to freshwater, quantified as river volume. We use change detection of river extent (a proxy for volume) to calculate seasonal and annual freshwater availability. We use monthly mosaic basemaps from the Planet Database from January 2016 to October 2019 ($N = 299$). Future research linking human archaeological isotope values to populations from places of low freshwater availability in the Wari domain can further clarify whether expansion was influenced by water scarcity and/or fluctuation.

DeAntoni, GeorgeAnn [214] see Panich, Lee

deBeaubien, Domonique [192] see Mahoney, Maureen

Decaix, Alexia [205] see James, Nathaniel

Decker, Michael [104] see Gabellone, Francesco

Dedrick, Maia (University of North Carolina at Chapel Hill) and Adolfo Batún Alpuche (Universidad de Oriente)**[57]***Celebrating Local Knowledge in Tahcabo, Yucatán*

Over the past several years, the Proyecto Arqueológico Colaborativo del Oriente de Yucatán has been working with residents of Tahcabo, Yucatán, to highlight local knowledge and narratives. Components of the project have included participatory research (e.g., photovoice), the development of a museum and heritage trail, the documentation of oral histories and local landscape knowledge, and heritage events and activities that promote the indigenous (Yucatec Maya) language. For example, our community events, at which we describe archaeological research and results, have also included local dance as well as song and rap in Yucatec Maya. The cenotes project engaged students in learning from elders about their landscape, in a process that led to the development of curricula for schools in Yucatán. The Tahcabo Museum, developed with community members in 2015, features artifacts and items donated by elders who wished to contribute to the stories featured within exhibits (presented in Maya and Spanish). In preparation for a new exhibit detailing the initial results of archaeological excavation in Tahcabo, we will hold discussions with the community's heritage committee to discuss research results as well as specific artifacts and determine appropriate narratives to highlight, with the goal of presenting archaeological findings together with local knowledge.

[57]*Chair***Deere, Bobi (University of Tulsa) and Jesse Nowak (University of Oklahoma)****[47]***Heavens on Earth: Cave Imagery and the Legacies of Mississippian Ceremonialism*

Cave art is amongst the earliest evidence of Art in the North American Southeast, and was instrumental in establishing Early Mississippian period Iconographic styles. Exploring the imagery found in caves across different cultural regions provides alternative contexts to understand distinct belief systems and ritual practices. This paper looks at the imagery found in caves in the Dhegihan ancestral territory compared to examples of cave art from the traditional ancestral territories of the Cherokee. Through exploring comparative examples, we consider how art with underworld related themes and symbolically charged depictions of games were made significant in cave settings.

deFrance, Susan (University of Florida)**[61]***Discussant*

deFrance, Susan [76] see Guiry, Eric

deFrance, Susan [260] see Muñoz, Lizette

Dega, Mike [100] see Dixon, Boyd

DeGeorgey, Alex (Alta Archaeological Consulting), Kevin Dalton (Alta Archaeological Consulting) and Carly Whelan (Chico State University)

[188]

Shared Heritage: WWII American Military Loss Sites in Europe

Historic archaeological sites associated with WWII American military losses on foreign lands represent the physical remains of a shared cultural heritage. Such sites are irreplaceable phenomena of significance to the past of both nations and for the knowledge and understanding of our shared cultural heritage. Recent recovery efforts at a B-17G (Flying Fortress) crash site in southwestern Poland provide an example of how archaeological investigations can meet both the DPAA mission objectives for accounting of missing U.S. servicemen and address host nation historic preservation requirements. Here we tell the story of the loss incident, describe working with the host nation, explain the methods used in the archaeological excavation, and show how artifacts recovered from the site, even those with no evidentiary value, have local interpretative value for public outreach and education. We examine one case study that includes a collaborative museum exhibition.

DeGeorgey, Alex [221] see Newland, Michael

DeGraffenried, Jennifer [66] see Hart, Isaac

DeLeonardis, Lisa (Johns Hopkins University), Dawn Kriss (Brooklyn Museum), Ellen Howe (Metropolitan Museum of Art) and Judith Levinson (American Museum of Natural History)

[258]

Blue on Clay: Indigo as a Colorant in Andean Post-fired Ceramic Paints

Indigo (*Indigofera*) is a recognized plant exudate employed in cloth dyes to produce the color blue. In Andean South America, it has been identified in textile dyes as early as the Late Formative (300 BCE–200 CE). While in other parts of the Americas the plant is utilized as a ceramic pigment (e.g., "Maya Blue"), in the ancient Andes its use as a paint colorant is virtually unknown. In this paper, we discuss the results of our recent study that demonstrate the presence of the exudate in Paracas (ca. 900–100 BCE) post-fired ceramic paints. Also identified in the paint are uric compounds consistent with reptile excrement. Use of the mixture occurs during a transition period with the Nasca (100 BCE) in which innovations in architecture, iconography, and craft technology are evident. Our discussion centers on how the plant figures within the broader context of these social, iconographic, and technological changes.

Delgado, James (SEARCH Inc.), Kyle Lent (SEARCH Inc.), Deborah Marx (SEARCH Inc.), Joseph Grinnan (SEARCH Inc.) and Alex DeCaro (SEARCH Inc.)

[18]

The Case for Clotilda

A systematic survey of a ship's graveyard outside of Mobile, Alabama disclosed the remains of a wooden vessel. Following a detailed analysis, the wreck has been identified as the likely 1855-built schooner Clotilda, the last vessel known to bring people to the United States to be enslaved when it concluded an illegal slave trading voyage in July 1860. The vessel was burned and sunk to avoid prosecution. The historical and archaeological context of Clotilda and likely next steps will be discussed.

[18]

Discussant

Delgado Espinoza, Florencio

[57]

The Converted Looters and the Community Advocacy on the Development of Archaeological Research in Coastal Ecuador

Clay figurines from north coast of Ecuador are world renowned for its remarkable technology and design and thus, ones of the preferred collector's pieces. Treasure hunters and looters have wondered in the area periodically specially searching Jama-Coaque figurines. In the area looting activities became a quotidian enterprise. During periods of economic crisis, looting increased exponentially. Recently local looters began to question selling looted pottery and began efforts to build a local museum to house the material. Forming into a cultural group, the approached the government control agency and contacted local archaeologists for that effort. While interacting with members of the community archaeology program of a local university, suffered a transformation. Now, they engaged into archeological protection and participatory research, becoming key community members advocating protection and research, and making efforts to convince their old peers about supporting sites' protection and academic research. Here, the history and testimonies of some of these converted looters are presented in order to illustrate how horizontal relationships and clear communication are essential to build up successful partnerships for archaeological research and protection.

Delsol, Nicolas (University of Florida)

[22]

Mesoamerican Cowboys: Exploring the History of Cattle Ranching in Colonial Mexico and Guatemala through Zooarchaeology

The introduction of cattle soon after the Spanish invasion had numerous and dramatic consequences over the society in New Spain. The historical scholarship on this topic emphasizes the prominent role of cattle ranching, which found its most iconic development in the great central Mexican haciendas that emerged over the sixteenth century and that contributed to shape the Mesoamerican colonial landscape. The development of ranching practices corresponds to what some authors have coined a "frontier economy" that often emerged in European colonial contexts. Open-range ranching, which can be defined as the free placement of ruminants on large areas of land with the intent to sell the animals as commodities on the market certainly had consequences not only over the management of the land but also on the organization of labor. Despite these historical accounts, what remains unclear is how widespread were these husbandry practices and what were the biological consequences on the animals themselves. To explore this

little-known dimension of Spanish colonialism in Mesoamerica, I propose here to model this mode of husbandry following a set of tests based on traditional zooarchaeological tools such as osteometrics, cull profiles and pathological markers applied to faunal assemblages from Mexico and Guatemala.

DeLuca, Anthony (University of Texas, San Antonio)

[202]

Mountains, Mountains, Everywhere, nor Any Peak to Praise? Further Exploring the Relationship between Guachimontones and the Landscape in Jalisco, Mexico

The Tequila Valleys region of Jalisco, Mexico is home to unique circular, ceremonial monumental architecture. This public architecture, colloquially referred to as circles, embodies the Mesoamerican cosmos with the central altar representing the sacred mountain. My previous research explored whether another architectural feature, the platforms that ring the altar, was oriented toward a common mountain using viewshed analyses in a GIS for multiple sites in the Valley, specifically determining if each circle had one platform oriented toward Tequila Volcano. While my initial hypothesis was not supported, other relationships between the circles and landscape were not fully explored in my previous analysis. I build upon my previous work by first examining the site of Los Guachimontones in which multiple examples of the architecture have known construction dates. I continue by evaluating whether other circles from different sites shared a common directionality toward their own respective landscape features, whether circles between sites were oriented toward one another as part of a social network, whether circles were oriented to ensure that landscape features were best viewed between platforms, and whether orientations toward landscape features complemented or contradicted astronomical data. The aim of this study assesses cosmological beliefs expressed through sacred architecture.

Delvigne, Vincent [30] see Fernandes, Paul

Dempsey Alves, Anna (University of Nebraska-Lincoln)

[142]

The Daily Grind: An Analysis of Ground Stone from the Basketmaker Communities Project in Southwest Colorado

Ground stone tools have been under-investigated by archaeologists since the beginning of research in the American Southwest. However, ground stone analysis is an excellent way to study many important aspects of life in the Pueblo past, including food production and gender, and therefore should not be overlooked. This paper uses methodology adapted from Jenny L. Adams's Ground Stone Analysis: A Technological Approach to analyze ground stone tools, including manos and metates, from Crow Canyon Archaeological Center's Basketmaker Communities Project. These analyses were used to examine diachronic change, as well as inter- and intrasite ground stone variance at seven Basketmaker III sites within a settlement cluster. This includes six neighboring hamlet settlements, as well as the Dillard site: a large, multi-habitation site with a Great Kiva. The results not only deepen our understandings of ground stone technology during the transition to full-time, sedentary agricultural lifestyles, but provide an avenue for examining community dynamics during this period.

Denham, Tim [235] see Barron, Aleese

Dennehy, Timothy [26] see Smith, Michael

Dennett, Carrie (National Museum of Natural History, Smithsonian Institution) and Lorelei Platz

[157]

When the Walls Fall Down: Resilience and Cultural Transformation in Late Classic Pacific Nicaragua

Geohazards impacted the development of precolumbian societies in various ways, and particularly so for those located along the western Central American Volcanic Arc (CAVA). Nicaragua has a compact chain of more than 20 volcanoes that collectively demonstrate a complex eruptive, seismic, and climate-related history. And while explosions, earthquakes, and torrential floods certainly brought about episodic social response to such disasters, in this paper we focus on human resilience and cultural transformation following a ca. AD 300 volcanic flank collapse known as "Las Isletas" in the Granada City area in Pacific Nicaragua. We begin by examining the massive collapse event, how it refashioned the physical landscape, and what was left in its wake. More importantly, we discuss how survivors with strong support networks would not only come to transform local ceremonial and ritual practice but also shape the sociopolitical and economic trajectory of the entire region for the next eight centuries. Of the many event-related outcomes, we focus here on the development of Potosi Applique effigy censers as a form of social response to volcanism and uncertainty in the local Late Classic period. Further, we explore Potosi's integral connection to the contemporaneous Mesoamerican "Spiked Censer" tradition that traversed the volcanic arc.

Dennett, Carrie [168] see Steinbrenner, Larry

DeOrbegozo, Mary Emma (University of Arkansas) and Bradley Chase Jones (University of Arkansas)

[242]

From a Bird's-Eye View to Satellites over Peru

Geospatial technology is a valuable tool for analyzing archaeological landscapes prior to or as a complement with surveys. Our project uses historical imagery, optical remote sensing and GIS to identify and record diachronic changes to likely archaeological features in the Chicama Valley (Peru) over a period spanning approximately 70 years. Post-war land-use changes, especially the introduction of industrialized agriculture greatly affected archaeological sites by disturbing cultural context. We record previously

undocumented features and recent impacts using Peruvian Servicio Aerofotografico Nacional panchromatic photographs from 1943 and recent high-resolution imagery from the IKONOS and WorldView 2 satellites. To identify sites, we developed a systematic approach based on a decision-tree that promotes consistent identification of features due to morphology, connection to ground survey data and proximity to verified sites. Subsequent change detection analysis clearly shows mounds shrinking, disappearing, and transforming into vegetation anomalies determined by surface area measurements. These results help document relationships between archaeological landscapes and industrialized agriculture. It reveals how preservation bias due to recent agriculture affects archaeological patterns and conversely reveals how archaeological sites impact modern agricultural use. This research can facilitate partnerships between agriculturalists and archeologists to better manage the productivity of agriculture and site preservation.

Derr, Kelly (Historical Research Associates Inc.)

[117]

Discussant

Derry, Linda [193] see Gordon, Falcia

Dersam, Sari (University of Wyoming), Scott Dersam (University of Montana) and Molly Herron (University of Wyoming)

[65]

High-Elevation Ceramic Workshop in the Beartooth Mountains: Interpreting a Possible Expedient Ceramic Technology

In 2018 ceramic sherds differing in form and appearance to Shoshone intermountain ware were found eroding out of a hearth feature at 3,333 masl in Montana's Beartooth Mountains (Dersam 2019). Over the 2019 field season, a thorough examination of the surrounding site and excavation of the hearth feature revealed a multi-event prehistoric ceramic manufacture area. The implications for locally made high-elevation ceramics could be far reaching for interpretations of the local prehistory. To better understand the cost and effort needed to rely on a broad-spectrum dietary strategy in the high-elevation regions of the GYE landscapes, an experiment was conducted. To test our in-field hypothesis of, "locally made ceramics", we prepared an experimental test of ceramic manufacture with the local materials observed within the site. The successful results of this experiment immediately raised another question, could ceramics in the correct context be considered an expedient technology?

Dersam, Scott (University of Montana)

[66]

Paleoindian Occupations and Broad-Spectrum Subsistence Behaviors in the High Elevations of the Greater Yellowstone Ecosystem

In the Greater Yellowstone Ecosystem (GYE) of Northwestern Wyoming and Southwestern Montana, several archaeological sites have been found hosting datable occupation surfaces attributed to the Angostura and Cody, Late-Paleoindian complexes (Davis et al. 1989; Frison 1999). The Angostura cultural complex has been consistently linked to evidence relating to a broad-spectrum subsistence strategy (Davis et al. 1989; Frison 1983, 1999), hypothesized to be taking advantage of the abutting eco-tone boundaries of mountain foothills and plains, where the Cody complex has been linked to big-game (primarily bison) hunting activities in the same eco-tones (Frison and Todd 1987; Shortt 2003). Recent discoveries of two separate Angostura and Cody linked localities at over 3,333 masl in Montana's Beartooth Wilderness raise questions about Paleoindian behavior and landscape use in the High Plains. 1.) Is there evidence of patterned high-elevation landscape use in the Paleoindian period? 2.) Could a "marginal" ecosystem (like the alpine) be effectively used by two different subsistence adapted Paleo-cultural groups? 3.) Should mountain ecosystems be considered "marginal"? These discoveries aid in renegotiating long-held notions concerning Paleoindian use of high-elevation ecosystems and broad-spectrum subsistence behaviors in the GYE, while additionally questioning current paradigms surrounding mountains as marginal ecosystems.

Dersam, Scott [65] see Dersam, Sari

Des Lauriers, Matthew (California State University, Northridge), David Madsen (University of Texas, Austin), Loren Davis (Oregon State University), Antonio Porcayo Michelini (Instituto Nacional de Antropología e Historia) and David Rhode (Desert Research Institute, UNR)

[170]

Deep Water Maritime Adaptations along the Pacific Coast of Northwest Mexico during and before Clovis Times

We are engaged in multiyear project investigating stratified shell midden sites on Isla Cedros, Baja California. Faunal remains include shallow water and pelagic fishes, an array of shellfish, sea turtle, sea mammal, sea bird, and trace amounts of terrestrial fauna. Of particular note is the presence of a well-developed technological system that emphasizes the exploitation of marine habitats. The fishing technology is characterized by the use of shell fish hooks (37 at a single site) and a distinctive steeply beveled scraper we hypothesize was used to produce Agave fiber line and netting. Over 30 associated radiocarbon dates spanning a range of ~8.5 to 13.5 cal BP have been recovered from intact stratigraphically excavated contexts. Associated small stemmed projectile points suggest a modest focus on hunting, though these may also have been deployed against marine turtles and sea mammals. A change in shellfish species through time may reflect a shift in ocean currents and a gradual warming in sea surface temperatures. Taken together, these patterns indicate a human ecological system adapted to a richly diverse marine environment. The antiquity of this system has implications for the timing, and especially the nature of the early human occupation of Pacific North America.

Des Lauriers, Matthew [66] see Thompsett, Neil

Deskaj, Sylvia [263] see Baci, Erina

Desrosiers, Dianne**[44]***Discussant*

Desrosiers, Dianne [127] see Maki, David

Dewan, Eve (Brown University)**[184]***Schooling and Sovereignty in the Grand Ronde Tribal Community*

When dozens of Western Oregon tribes and bands were relocated to the Grand Ronde Reservation in 1856, one of the rights guaranteed by the federal government in their ratified treaties was a formal education. The story of education at Grand Ronde—both formal and informal—is intimately connected to stories of self-determination, community, and the transmission of many types of knowledge through several generations. This poster introduces several schools that children at Grand Ronde have attended from the establishment of the reservation through today, and shares the results of geophysical, archival, and oral historical research, as well as several seasons of excavation. It also highlights how the Field Methods in Indigenous Archaeology field school, through its low-impact methodology, has contributed to the study of several of these locations in partnership with the Confederated Tribes of Grand Ronde's Historic Preservation Office.

Dewar, Genevieve [76] see Feak, Angela

Dewar, Genevieve [77] see Waters, Albert

Di Giusto, Marina (University of São Paulo, Brazil) and Veronica Wesolowski (University of São Paulo, Brazil)**[240]***The Final Period of the Shell Mound Occupation: Life on the Southern Coast of Brazil from the Case Study of the Içara-01 Conchiferous Site*

The archaeological site Içara-01 (1630–1390 ys cal BP), located on the southern coast of the state of Santa Catarina (Brazil), has been interpreted as a cemetery and temporary camp used by horticultural groups from the plateau. However, the results from a bioarchaeological study of human remains (n=35), when interpreted alongside data from shell mounds in the region (e.g., Jabuticabeira II), lead us to reinterpret the lifestyle of this group. The data for the individuals buried in Içara differ from the data observed for groups of coastal camps and are more similar to the pattern found for shell mounds, in the same period. Through this case study, by comparing the Içara-01 results with those from the fishmound layer of Jabuticabeira II (1864–1534 years cal AP), we reinforce the idea that there was social reorganization during a period of the contact intensification between the southern plateau and coastal groups. Rather than suggest population replacement, pathological and weaning data for these individuals suggest a degree of accommodation between the two groups and allow us to reflect upon people's lifestyles on the southern Brazilian coast during the last period of shellmound occupation.

Diaz, Alice**[246]***Featherwork in the Tairona Area: Making an Intangible Object Traceable?*

The techniques of featherwork have been under scientific scrutiny in the Americas in Mesoamerica, the Andean, and the Amazonian region through the study of written sources and artifacts. But how would it be to think archaeological investigation of said techniques in the Tairona area, a context in which the objects referenced by ethnohistorical sources have never been found, and said sources are not describing techniques of featherwork? How can archaeologists link an element whose existence is only known through an intangible piece of data to a material trace (the only language they speak)? The question is relevant for other crafts (leather, cotton, salt, etc.) and other notions (empathy, ethnicity, affection, etc.), and the method used to obtain a list of potential material traces of featherwork in the Tairona area could have potentially useful ramifications for other processes of investigation.

Diaz, Lucia (Washington University, St. Louis), Sarah Baitzel (Washington University, St. Louis) and Xinyi Liu (Washington University, St. Louis)**[61]***Paleodiet Reconstruction and Migration at Los Batanes, Sama Valley (Peru): Agropastoralism on the Eve of the Tiwanaku State (Eleventh Century AD)*

Agropastoralists facilitated the vertical exchange systems of complex societies in the south-central Andes by producing and mobilizing animals and goods across diverse ecological floors. One such group, the Cabuza, occupied the site of Los Batanes (500 masl), Sama Valley, Peru, in the Northern Atacama Desert during the later period of the Tiwanaku diaspora (tenth–twelfth centuries AD). This study reconstructs Cabuza diet through stable isotope analysis of human remains from Los Batanes, lending insight into the foodways and lifestyle of a previously little-known population of Tiwanaku affiliation. Similar to Tiwanaku communities in the altiplano and lowland valleys, we expect the residents of the site to show reliance on maize as a staple crop. However, we anticipate results to show enriched nitrogen isotopic values due to a subsistence focus on camelid herding and proximity to the coast. Archaeological and modern plant and animal tissue provide a baseline for the Sama valley ecology, while skeletal, dental, and hair tissues of individuals from Los Batanes reflect diet at different stages of the life course. The results of our study highlight the importance of agropastoralism for diversifying a maize-based diet through access to animals and mobility into diverse ecological niches.

Díaz, Luis (Asociado)**[260]***Yaracachi, un sitio arqueológico multicultural en el valle de Moquegua, al sur del Perú*

Nuestro trabajo tiene como objetivo analizar el sitio arqueológico de Yaracachi (Nomenclatura: M-225), un panorama que no resulta fácil de estudiar por la escasez de datos publicados, pero que poco a poco va ampliándose con nuevos descubrimientos.

Moquegua es un departamento del Perú situado al sureste del país, en la vertiente occidental de la Cordillera de los Andes. Limita con las regiones de Tacna, Puno y Arequipa y es ribereño del océano Pacífico. La zona de estudio se encuentra en las laderas de la zona de Yaracachi, entre los 1,374 y 1,400 m sobre el nivel del mar, margen izquierdo del río Osmore, hacia el costado noroeste de la ciudad de Moquegua. El periodo que nos ocupa es muy amplio, y las formas de vida que tienen lugar durante ese tiempo, son muy diversas. Las diferencias entre unas y otras pueden deberse a cambios acontecidos a lo extenso del tiempo como resultado de una evolución cronológica de las pautas de los grupos humanos que habitaban la región. La evidencia de una ocupación temprana en Yaracachi es advertida por el hallazgo de un vestigio habitacional (plaza circular hundida) relacionado con un conjunto de enterramientos del Intermedio Tardío y Horizonte Tardío.

Díaz-Andreu, Margarita**[25]***Chair*

Díaz-Andreu, Margarita [25] see Coltofean-Arizancu, Laura

Díaz-Andreu, Margarita [25] see Jiménez Pasalodos, Raquel

Díaz-Granados, Carol (Washington University, St. Louis) and James Duncan**[47]***The Braden Art Style: Its Shadowy Beginnings in Dark Zone Cave Art*

Braden, a distinct style of human figural art, has long been a topic of interest to archaeologists and iconographers. Braden originates in the southern Prairie Peninsula and lower Missouri River Valley once occupied by Siouan populations. These people re-established an interactive ideology while developing a complex social structure based on an elaborate cosmology. Evolving technology in pigment sample dating helped establish the earliest anchor allowing key Braden elements to be placed into a firm stylistic chronology. Braden originated in a Woodland culture setting that involved a resurgence of liturgical symbolism long existing in oral traditions.

Díaz Sibaja, Roberto [198] see Martínez Vázquez, Dante Bernardo

Dickson, Catherine**[116]***Discussant*

Dickson, Ephriam [52] see Nelson, Shaun

Diehl, Richard**[152]***Discussant***Diehl, Richard****[181]***Discussant***Diehl, Richard****[191]***Discussant***Dierks, Zachary (University of Iowa)****[63]***Debitage and Tools: Lithic Analysis at Woodpecker Cave*

Woodpecker Cave is a Middle to Late Woodland site in Johnson County Iowa with at least three occupation layers, each of which were likely occupied during the winter months. It was the site of a University of Iowa summer field school led by Professor James Enloe from 2012 to 2018. Within these excavations a total of 2547 lithic artifacts were found. In the 2018 excavation alone there were 319 pieces ofdebitage and 58 retouched tools. These artifacts were examined morphologically to determine possible technological usage and raw material. Raw material identification was done by cross comparison of type collection from known source locations at the Office of the State Archaeologist, Iowa City. Given the seasonal nature of the occupations, our expectation would be that tools would be taken to the site and taken with the occupant as they left the site each season. The site'sdebitage will be the focus of this poster and classified into a number of categories to examine the activities and technologies in play at the site as well as the mobility of the occupants.

Dillehay, Tom

[90]

Discussant

Dillehay, Tom

[170]

Mike and Monte Verde

This paper discusses my perception in the late 1970s to mid 1980s of the reactions by and approaches of several renown First American archaeologists to the edge-trimmed pebble tool assemblage at Monte Verde. Special attention is given to Mike Collins, who immediately recognized cultural types and patterns that distinguished the assemblage from "just broken rocks." Mike was able to put aside any biases he might have held as a bifacial lithic and Clovis technology expert to objectively evaluate the Monte Verde assemblage. His reaction and approach are discussed and compared briefly to those of others who examined portions of the assemblage.

Dillehay, Tom [23] see Netherly, Patricia

Dillian, Carolyn (Coastal Carolina University)

[97]

Working with Non-Federally Recognized Tribes: The Waccamaw Indian People

The Waccamaw Indian People in South Carolina are a state-recognized, but not federally recognized, tribe. They are compiling the documentation necessary to petition for federal status through the BIA's Federal Acknowledgement Process, but it is a cumbersome and sometimes arbitrary process that preferentially weights the experiences of western tribes, who were impacted by colonization after the establishment of the United States government. Eastern tribes, particularly those in the coastal southeast, were impacted during the early years of European contact and exploration, and as a result, by the late eighteenth century, were not positioned to negotiate treaties and agreements with the U.S. government, a particularly important evidentiary item in the federal recognition process. As the Waccamaw Indian People pursue federal recognition, there is an emerging picture of early historical contact, dispersal, and cultural resilience, within the context of competing racial, economic, and political interests between tribes, states, and the U.S. government. The experience of the Waccamaw Indian People echoes the legal battles fought by other non-federally-recognized tribes in the American southeast. It is necessary for us to understand the challenges faced by these tribes, and the importance of collaborating and consulting with them.

[97]

Discussant

Dillon, Scott [190] see Robinson, Francis

DiMarco, MacKenzie (Indiana University Bloomington)

[184]

Archaeological Heritage in Belize and Play 360

During the 2019 summer field season, I traveled with an Indiana University Wells Scholars Program to Belize to help coordinate a Play 360 program and install playground equipment at a Maya high school. This project was informed by knowledge of local Maya heritage. On this poster, I examine how western archaeological knowledge intersects with traditional Maya knowledge to influence the creation of common play areas. I argue that archaeologists should be more involved in activities like this. Instead of considering western volunteer travel and service learning as completely outside of archaeological discourse, we should be working with groups (such as Play 360) to generate more effective means of engaging with local communities. Archaeologists are uniquely positioned to undertake this work due to their focus on the past and often long lasting engagement with local communities.

DiNapoli, Robert (University of Oregon), Timothy Rieth (International Archaeological Research Institute), Carl Lipo (Binghamton University) and Terry Hunt (University of Arizona)

[24]

A Stratigraphic Approach to Developing Chronologies for Monumental Architecture: A Rapa Nui (Easter Island) Case Study

Patterns of monument construction offer direct evidence for addressing a variety of questions. Periods of intense activity reflect the ability of groups to engage in organized and cooperative efforts, while cessation of construction might suggest "collapse." Resolving the tempo of monumentality, however, is often fraught with ambiguity given a lack of formal modeling, uncritical use of radiocarbon estimates, and a lack of attention to the information embedded within complex architectural stratigraphy. Here, we illustrate a Bayesian model-based approach to dating monumental structures that integrates radiocarbon dates and relative architectural stratigraphy to examine temporal fluctuations and correlations in monument construction activity. Using Rapa Nui (Easter Island) as a case study, we demonstrate that statue platform (ahu) construction began quickly and increased rapidly after colonization, sometime between the early fourteenth and mid-fifteenth centuries AD, with a steady tempo of construction events continuing into the eighteenth century. These results are significant, showing that a pre-contact "collapse" of ahu construction did not occur, but continued into the historic era despite the impacts of European arrival. Our model-based approach and its relationship to societal change can be extended to other case studies where similar debates surrounding the tempo of monument construction remain unresolved.

DiNapoli, Robert [135] see Hanna, Jonathan

Dinkins, Gerry [78] see McKenna, Kathryn

Diop, Pape Laity (Cheikh Anta Diop University, Dakar Senegal)

[273]

Another Form of Slave Ship: Local Nautical Technologies and Practices in the Persistence of the Senegambian Slave Trade (1818–1888)

Despite its abolition by France in 1818, the slave trade continued along the coasts of Senegambia until 1888. When, in 1822, France created a special African naval squadron stationed at Gorée Island to patrol the West African coasts, slave traders in the Senegambia responded by developing new strategies to escape French vigilance. This paper explores these strategies, focusing in particular how slave traders began to use less conspicuous local dugout canoes to transfer slaves to the Cape Verde islands where the slaves were then loaded onto larger slave ships for Transatlantic exportation. Examining the structural characteristics and technical efficiencies of these local watercraft that represent another form of “slave ship”, this paper also demonstrates how slave traders exploited the weakness of trafficking contraventions laws and the bad faith of authorities. These strategies effectively neutralized naval security, enabled the traffic to persist for almost seventy years after it became illegal, and even transformed the transatlantic segment of slaving voyages by significantly shortening the distance travelled on larger ships from Cape Verde, destined primarily for Cuba and Brazil.

DiPietro, Lyndsay and Kelly Graf (Center for the Study of the First Americans, Texas)

[81]

Micromorphological Analysis of Deposition, Pedogenesis, and Stratigraphic Integrity at the McDonald Creek Site, Central Alaska

Despite the fact that archaeologists have long turned to the Alaskan archaeological record to answer questions about the first Americans, little is certain about the peopling of Beringia. The poor preservation of faunal remains in many central Alaskan archaeological sites has made understanding the variability of lithic assemblages and, by extension, the behavior of early Beringian populations difficult. The McDonald Creek site, a multicomponent site containing at least two late Pleistocene assemblages, including lithic artifacts and faunal and macrobotanical remains in a primary context, may shed new light on the relationship between the inhabitants of the site and their changing environment over the course of the late Quaternary. This study uses soil micromorphology to characterize the depositional and pedogenic processes that have led to the development of the sediment package at McDonald Creek, as well as to assess the extent to which periglacial processes and solifluction may have disturbed the integrity of the archaeological record at the site. This new understanding of soil development helps to establish the sequence of paleoenvironmental changes at the site since the late glacial period and will help to contextualize the technological, subsistence, and settlement records at McDonald Creek.

Diserens Morgan, Kasey (University of Pennsylvania) and Kathryn Morgan

[165]

Rethinking Facadism: How Governments Use Heritage to Control the Maya Past

Political involvement in the protection of historic resources often places a façade on historic narratives that creates a distance between communities and their heritage. Often, this control reflects leftover colonial legacies, creating structures of power that do not allow communities to advance economically, socially, or politically. This paper explores the events leading up to a declaration of national patrimony and creation of a historic zone in Tihosuco, Quintana Roo, Mexico. Tihosuco was the epicenter of the Caste War (1847–1901), an indigenous rebellion that sought freedom from oppressive social and economic systems. Tihosuco has many colonial era houses, built in the eighteenth and nineteenth centuries and then largely abandoned until the 1930s. Families living there today continue to use the houses as residences, many of them needing extensive work to be truly functional again. Government interventions have thus far only done restoration work on the facades, which does little to reestablish them as usable dwellings, and leaves those most at risk untouched. Yet, the small influx of capital into the buildings and their recognition as national patrimony has established them as assets in a desired tourism industry, and politicians capitalize on that potential benefit to further their own careers.

Dixon, Boyd (Cardno GS Inc.) and Mike Dega (Scientific Consulting Services Hawaii)

[100]

Placing the Early Pre-Latte Period Site of San Roque on Saipan in Its Broader Context: 1500–1100 BC

This comparative assessment of the San Roque site in northern Saipan to other early Pre-Latte Period sites in the Mariana Islands, circa 1500–1100 BC, presents far from uniform data that suggest that maritime settlers of the archipelago may have targeted a range of natural settings for survival upon arrival. These settings appear to have included inland estuaries and marshes for planting aroids, cliff lines with caves for fresh water and native forest resources, and beach dunes with shallow lagoons and offshore reefs for suitable canoe landings from which to fish and travel. This pattern of extensive horticulture and arboriculture complimented by maritime subsistence activities, likely stemmed from a much older if not foundational tradition of risk minimization, or acknowledgement of and adjustment to climate instability in their SE Asia near-coastal homelands. Recent DNA research and similarities in material culture suggest multiple origins along a “cultural corridor” from the Philippines to Sulawesi and island Melanesia circa 1500–1100 BC, long enough to foment Lapita and Pre-Latte traditions in what was by then no longer Remote Oceania.

Dixon, E. James (Maxwell Museum) and Loren Davis (Oregon State University)

[238]

The Rose Room Workshop

This presentation reports the outcomes of a workshop held at the Smithsonian Institution Museum of Natural History, Washington,

DC, June 2019. The workshop identified stakeholders, collaborations, and synergistic relationships to establish and expand cooperative interdisciplinary and agency partnerships to encourage, advance, and support submerged landscape (non-shipwreck) archaeology and paleoecological research on North America's continental shelves and the Great Lakes. Participants defined stakeholder interests, federal and state responsibilities, sources of fiscal support, methodological and technological needs, and tribal and cultural interests and concerns. Working groups identified potential ways to establish cooperative structure(s) to consolidate and/or pool human, logistic, technological, and financial resources to advance research. Results and recommendations for future directions were defined in a summative action plan. Fiscal support provided by the National Science Foundation, OPP #1735494, Smithsonian Institution, Department of Anthropology, Museum of Natural History, and Oregon State University.

Dobney, Keith [100] see Weyrich, Laura

Dobos, Adrian [162] see Chu, Wei

Dobrov, Amanda (UC Berkeley)

[71]

Cabinets of Curiosity: The Forgotten Collections

Archaeological research comes in many forms, the most common and well known variant is excavation. However, due to such excavations there has been a considerable amount of materials recovered, some of which has been studied but far more that still needs to be studied. This presentation is part of a larger panel discussion about the benefits and drawbacks of using previously excavated collections and the larger, important, picture this type of research helps develop. This presentation will center around personal experience working with a forgotten collection of third century Roman-era Tunisian Amphora buried in the basement of the American Academy in Rome. This collection was excavated in 1993 and some preliminary inventory type work was done on the collection the following year. When the collection was turned over to me in the summer of 2016 it had sat untouched for 22 years. This kind of data is still valuable and useful information that as excavating continues scholars forget about what the data they do have can contribute to current research.

Dodge, Aina

[113]

Discussant

Dodge, Robyn (University of Texas, Austin)

[53]

Household Ritual Expression at Hun Tun

Ritual is a cultural and temporal construction used to express religion, social experience, and world ideology. Every member of society conducted rituals. Evidence of such events are documented in the archaeological record and provide insight into ancient Maya society. The northwestern region of Belize is host to an abundance of "support" communities located throughout the hinterland near major urban centers. This paper examines the types of rituals documented in the hinterland at the commoner site, Hun Tun during the Late/Terminal Classic period. An analysis of small-scale household archaeology will be applied. Evidence for localized site-specific rituals, along with data demonstrating a general regional continuity regarding ritual expression will be explored. Specifically, household dedication, termination, and veneration rituals will be discussed as they have been identified at Hun Tun. Evidence for water rituals associated with the presence of limestone monuments and a sweat bath will also be presented. Lastly, the significance of cache dedications at Hun Tun will be discussed in terms of the materials and locations identified. This synthesis will demonstrate how rituals at Hun Tun were both economic and social expression of ancient Maya life ways in northwestern Belize.

Doelle, William (Archaeology Southwest)

[58]

Unfinished Business: Facilitating Synthetic Research by Expanding Access to Digital Databases

The digital technology that helped Desert Archaeology gain a foothold and grow in the early 1980s today looks like a fossil from an ancient geologic era. Fortunately, digital databases evolved rapidly over time, and Desert Archaeology made major investments in an integrated company database. That database made the results of past research accessible for all new projects, which made synthetic research more cost-effective and feasible. As the CRM arena has grown dramatically, commitments to databases have been highly variable. In addition, databases are generally internal to each company. Today, nonprofit Archaeology Southwest and a team of partners at the University of Arizona, Arizona State University, and University of Colorado, Boulder, are developing cyberSouthwest, a regional database that will be internet accessible. The site-level component of this database is richly populated with ceramic, obsidian, and public architecture data. The intrasite component of cyberSouthwest is progressing rapidly. It addresses the "unfinished business" of my paper title. It has the potential to make the massive amount of digital CRM data that has accumulated over the past two decades broadly accessible.

Doering, Briana (University of Michigan), Joshua Reuther (University of Alaska, Fairbanks), Scott Shirar (University of Alaska, Fairbanks) and Holly McKinney (University of Alaska, Fairbanks)

[82]

Reconstructing Late Holocene Behavior at Quartz Lake, Alaska

This poster combines data from compound-specific isotopic sampling, x-Ray fluorescence, and traditional material analysis from two

components at the Klein Site to reconstruct behavior on Quartz Lake ca. 1200–500 years ago. The results of this analysis show that lake environments played an important role in the Athabascan seasonal subsistence strategy, and that Quartz Lake was likely at the crossroads of larger late Holocene trade networks. Ongoing research continues to refine our understanding of the central role of lacustrine settings in late Holocene Athabascan subsistence and mobility strategies following the White River Ash eruption and prior to the effects of European colonization.

Doherty, Caitlin (Texas A&M University)

[195]

Paleoindian Raw Material Procurement in the Eastern Great Basin: The Utilization of Obsidian and Fine-Grained Volcanics at Smith Creek Cave and Bonneville Estates Rockshelter

Geochemical analysis of lithic raw materials and artifacts has proven useful in the Great Basin with regard to understanding prehistoric forager mobility. Particularly in the eastern Great Basin where high-quality obsidian sources are available and easily differentiated geochemically using portable X-ray fluorescence (pXRF) technology, archaeologists have been able to delineate catchment areas within which prehistoric peoples procured obsidian for toolmaking. Similar efforts to understand the procurement of other fine-grained volcanic toolstone in the region have been more difficult. Recent geochemical analysis of lithic artifacts from the Paleoindian components of Bonneville Estates Rockshelter and Smith Creek Cave encountered this difficulty—while the obsidian artifacts grouped easily with samples of known obsidian sources, the fine-grained volcanic artifacts could not be as easily identified and sometimes were not as easily distinguishable. Here, the same lithic assemblages are analyzed, incorporating old data, in light of additional geologic samples of obsidian and fine-grained volcanics from the eastern Great Basin that were collected during a toolstone survey in the summer of 2019. The results of the fine-grained volcanic data provide a useful comparison for evaluating the catchment zones delineated for Paleoindian hunter-gatherers on the basis of obsidian data.

Dolan, Brennan

[175]

Hand-Held lidar at 13AM130: Merging Site Stewardship and Data Accuracy

Archaeologists and cultural resources managers have an ever-increasing tool kit to aid in the documentation and management of archaeological sites. Over the last few years the Iowa Department of Transportation (DOT) has been employing a hand-held light detecting and ranging (lidar) unit to map resources around the state. Through this technology, and the accuracy it offers, we have been able to make strides specifically in the management of earthworks that are part of the Iowa DOT's Statewide Historical Sites Inventory and Management Plan. These types of sites are engaging for us as cultural resource managers as well as our Tribal partners. We find that lidar data, being noninvasive, is a better way to manage these places. Recently, as part of a mitigation effort, we mapped Site 13AM130, a small group of effigy mounds in Allamakee County, Iowa. This presentation shares new information as well as management recommendations offered based on the 3D data collected. The focus of this presentation is that earthworks (and similarly significant site types) benefit from highly accurate lidar data for future site stewardship.

Dolan, Sean (N3B Los Alamos)

[129]

Comparing the Life Histories of Turkeys and Tropical Birds in the Mimbres Valley, New Mexico

For the past 2,000 years, Pueblo communities in the American Southwest and Mexican Northwest have woven turkeys and tropical birds (macaws and parrots) into their economic, social, and ceremonial fabric. Pueblo groups in the past did not view all birds as being equal, and neither do archaeologists today as we study turkeys and tropical birds more so than any other avian species. Archaeologists study these birds separately using similar methods, but here I use pottery iconography, genetics, diet, and other contextual evidence to compare and contrast how people in the Mimbres Valley of southwestern New Mexico acquired, managed, and interacted with these birds during the Classic period (AD 1000–1130). Turkeys and tropical birds are uncommon in Classic period avifaunal assemblages, and they had similar but different life histories. This comparative study contributes to key issues in anthropological archaeology and social zooarchaeology as I discuss the use of birds for ritual and utilitarian purposes, socio-ecological interactions between humans and birds, and cross-cultural pathways of domestication, husbandry, and aviculture in small-scale agricultural societies.

Dombrosky, Jonathan (University of New Mexico)

[22]

The Impact of Fish Body Size on Ancestral Pueblo Foraging Decisions in New Mexico, ca. AD 1350–1600

Small numbers of fish remains are frequently recovered from Pueblo IV (AD 1350–1600) sites in the Middle Rio Grande basin of central New Mexico, but fish remains are rare during earlier time periods. Increased aquatic habitat quality during this time could have increased fish body size, and the energy obtained by Ancestral Puebloan fishers could have been maximized if fishes provided more calories due to their increased size. Paleozoologists, however, frequently estimate the body size of fishes from skeletal remains with linear measurements and cherry-picked specimens. Such an approach will not work with archaeological fish assemblages from the American Southwest/Mexican Northwest. The relatively small size of fish assemblages requires that the remains present are used more efficiently. Here, I use a 3D geometric morphometric approach to more accurately and efficiently estimate the body size of archaeological fishes from fragmented skeletal remains recovered from the Middle Rio Grande. Such an approach can help rigorously test whether or not a shift in body size made the pursuit of fishes in small quantities optimal for Ancestral Pueblos.

Dombrosky, Jonathan [171] see Jones, Emily Lena

Dombrosky, Jonathan [129] see Kirk, Scott

Dombrosky, Jonathan [129] see LaZar, Miranda

Domeischel, Jenna (Eastern New Mexico University) and Susan Kuzminsky (Eastern New Mexico University)**[172]***Kittens, Mittens, and Skulls: Dealing with Unsolicited Donations in Museums*

Due to the implementation of the Native American Graves Protection and Repatriation Act (NAGPRA) in 1990, many archaeologists feel confident in dealing with the issues that arise with the excavation, processing, and repatriation of human remains. Indeed, having an established protocol in the United States has helped to eliminate legal or ethical questions that arise with repatriation and curation, especially in museums or other institutions where remains were once displayed openly. However, questions remain when dealing with donated artifacts and human remains from private lands and remains whose provenience is entirely unknown. At the state or local level, there is not always a defined policy for these situations. Moreover, what are our professional and ethical responsibilities when creating and sharing virtual 3D osteological collections? We discuss case studies that address how to handle the curation of human remains and artifacts that do not fall within NAGPRA guidelines—and what to do when skeletal remains and other objects are left on the museum doorstep.

Domenici, Davide (University of Bologna, Italy)**[258]***Not Only Glues: Observations on the Use of Resins in Mesoamerican Mosaics*

The paper discusses some specific uses of resins on Late Postclassic Mesoamerican mosaics. While resins were mostly used as adhesives to glue the tesserae to the underlying surface, in various instances we can observe a different use, aimed at creating visible formal details which had a clear aesthetic and semantic value. At least in one instance, for example, resin-coated surfaces meant to remain visible to the observer were created to represent a specific item of a godly attire. Moreover, in a set of Mixtec mosaics, a “gritty” resinous material, mixed with sand or stone fragments of varying granulometry, was used to cover ample surfaces in order to convey a key meaning related with the identity of the represented divine beings. In other instances, a peculiar joint use of resin and shell tesserae to represent human and animal eyes characterizes a specific subset of mosaics, which also share other stylistic traits as well as a common collection history. The cases discussed in the paper show how the study of the “aesthetic” use of resins, especially when paired with scientific analyses aimed at their chemical characterization, could provide useful hints for a cultural-historical interpretation of Mesoamerican mosaic art.

[258]*Discussant*

Domic, Alejandra [59] see Bruno, Maria C.

Domínguez, Miriam (Florida Museum of Natural History)**[257]***An Archaeological History of the Tamaylacha (Jubones) River Basin, circa First Millennium BCE*

The earliest written descriptions of the Tamaylacha (Jubones) River and its surroundings were penned by the priest Pedro Arias Dávila (1582) during his journey(s) through Cañari territory. These were followed by the accounts of Francisco José de Caldas—with von Humboldt and Bonpland in 1804, Verneau and Rivet (1912), and a few other observers of what today is southern Ecuador and northern Peru. Beyond these chronicles and travelogues, archaeological analysis of this inter-Andean river basin further refines our understanding of the indigenous history of the region. This talk outlines, first, the results of the compositional analysis conducted on the ceramic wares from the site of Potrero Mendieta, dated to around the first millennium BCE, which are interpreted as proxies of social inter-regional interaction. Second, the spatial configuration of the site, which lies on a flat hilltop overlooking the Jubones, will be discussed and the results of the preliminary excavations of the semi-sunken circular structures that were built at Potrero Mendieta will be presented. Finally, the regional significance of this human enclave will be contextualized with regards to the broader research on the Formative of Southwestern Ecuador.

Dominguez, Victoria [257] see Ayers-Rigsby, Sara

Dominguez Carrasco, Maria del Rosario [168] see Folan, William

Donathan, Gavin [77] see Waters, Albert

Dong, Ke [161] see Wright, David

Dongoske, Kurt (Zuni Cultural Resource Enterprise), Giorgio Hadi Curti (Cultural Geographics Consulting) and Octavius Seowtewa (Zuni Cultural Resource Advisory Team)**[127]***Contested Geographies and Zuni Efforts to Protect Their Inheritance: The Role of Epistemology and the Problem of Representation*

Zuni geography, or earth writing, manifests in the landscape through the material presence of ancestral sites, ancestral writings (petroglyphs), sacred places, and other resources of traditional importance. Zuni geography is an inheritance from the Zuni ancestors, and contemporary Zunis have stewardship responsibilities to protect and appropriately manage this inheritance both in honor of the past and in pursuit of healthy and viable futures. Capitalist geographies, or exploitative appropriations and distortions of space and landscape through practices of dominant Western civilization are embedded in epistemologies of Western science and

an ontological system that promotes a severing with the past, where “old” knowledge is dismissed through limited and limiting notions of “progress” and “development.” Zuni knowledge and ways of being/becoming are often at odds or not appropriately respected by Western science, creating conflicts in the ways in which Zuni knowledge is represented, acknowledged, respected, or disregarded in consultation processes. This paper argues that at heart of these contested geographies are Western epistemological and ontological systems that privilege their own narrow representations as absolute truth, thereby systematically failing to both account for and respect Zuni knowledge and its differences and honor the very purpose of consultation.

Donn, Leila (University of Texas, Austin), Timothy Beach (University of Texas, Austin) and Cody Schank (University of Texas, Austin)

[206]

Lidar-Based Machine-Learning Computer Program to Identify Archaeological and Natural Features in the Maya Lowlands of Belize, Guatemala, and Mexico

Computer programs that can automatically identify natural and archaeological landscape features are extremely useful for conservation and resource management, natural hazard monitoring, and planning and development work. The first author is using Python, GIS, and lidar imagery to develop machine-learning computer programs to identify several different types of landscape features that are located in hard-to-access areas under dense tropical forest canopy. These features include cave entrances, archaeological mounds, Maya architecture, and ancient wetland fields. This type of modeling can be applied to other kinds of landscape features with distinct morphologic characteristics, even features obscured by vegetation. Research thus far has completed a beta-version of the cave entrance identification program along with one season of ground-verification in northwestern Belize that has successfully identified several caves and cave-like features. Further research includes refining the machine-learning model and integrating other types of archaeological features using several lidar-based training datasets shared by archaeological projects in northwestern Belize, the Petén of Guatemala, and Mexico.

Donner, Kristin (Seyitömer Höyük Illustration Project) and Laura Harrison

[104]

Mix, Mold, Fire! Multimedia Educational Outreach Inspired by Bronze Age Archaeology

While fascination with archaeology is commonplace among children, family media content often focuses on problematic narratives of treasure hunting. Archaeologists and educators need to reach out to young audiences with a more balanced narrative that conveys the value of heritage and counteracts the perception of archaeologists as looters. In this paper, we discuss a preschool, fourth grade and sixth grade version of a multimedia educational outreach lesson that incorporates 2D comic art, 3D representations of heritage objects, and experimental archaeology. All lessons begin with an introduction to the comic “Mix, Mold, Fire!” that features the misadventures of Abby, a young apprentice potter in the Early Bronze Age village of Seyitömer Höyük in Anatolia, whose activities are archaeologically attested. Multimedia lessons expand on her story: pottery-making activities are based on Abby’s methods, and students interact with 3D scans and 3D prints of heritage objects then create their own archaeologically-inspired comic stories. These lessons introduce young audiences to fundamentals of archaeology “at the trowel’s edge,” and allow them to learn techniques of visual storytelling by building narratives about the past based on their interactions with 3D scanned heritage objects.

Donta, Jaime (POWER Engineers)

[114]

Moderator

Doperalski, Mark [190] see NH, DHR

Doperalski, Mark [66] see Oberheim, Paul

Doroszenko, Dena [228] see Patton, Katherine

Dotzel, Krista (University of Connecticut)

[13]

The Deer Are Just Going to Eat that Corn: Agriculture, Mobility, and Maize Processing in Southern New England 2000–500 BP

This paper will explore questions regarding the relationships between mobility, food production, and maize processing in Southern New England between 2000 and 500 BP. Dr. Brian Jones, a keen gardener of native crops, approached these issues rooted in years of his own experience. How did people in Southern New England grow, process, and eat their crops? How might this have changed over time? Can groups grow maize while maintaining seasonal mobility? Dr. Jones was always willing to help think through practical considerations surrounding these questions and approach them with a critical, yet open-minded eye. In that spirit, this paper will examine phytolith evidence for domesticated and wild plants and examine the relationships between plant processing strategies, settlement strategies, and resulting phytolith assemblages at sites including Burnham-Shepard, RI 110, Selden Island, the Cooper Site, Hamburg Cove, Deer Run, and RI 1428.

Dou, Jiaxin [36] see Wei, Tianxu

Doubles, Catherine (University of Louisville), Jake Lulewicz (Washington University, St. Louis), Jason King (Center for American Archeology) and Jane Buikstra (Arizona State University)
[264]

Habitation and Interaction at the German Site (11C377)

The German site (11C377) is a Late Woodland habitation site (ca 800–1200 cal CE) located at the McCully Heritage Project on a colluvial slope north of Crawford Creek, approximately 2 miles west of the Illinois River. During the 2019 field season, Center for American Archeology field schools conducted geophysical survey and excavation at the site. Magnetic survey results suggest multiple structures and associated features at the site. CAA field school students partially excavated one house basin and several associated features containing Late Bluff/Jersey Bluff pottery and associated residential debris. In this paper, we report this summer's fieldwork and discuss preliminary results, placing the site in context of other regional and American Bottom Late Woodland occupation sites.

Doucette, Dianna (Public Archaeology Laboratory [PAL])

[13]

Assessing Archaeological Sensitivity along the Charles River: How Can the Physical and Cultural Landscape of Today Be Applied to Native American Settlement Choices Thousands of Years Ago?

Settlement patterning and the predictability of patterning was often revisited by Brian Jones in his research. This paper considers the predictability of Native American settlement choices along the Charles River and its many tributaries in eastern Massachusetts during the Pre-Contact Period and draws from numerous surveys conducted by The Public Archaeology Laboratory, Inc. (PAL) and other professionals over the past five decades.

Dougherty, Haley (University of Nevada, Las Vegas)

[130]

Urbanization in the Maya Way of Life

Although many researchers have addressed underlying themes in the history of urban studies for Maya archaeology, I argue that some literature could provide more excavation data in an understudied area of archaeology. Current approaches to urbanism may not be the most practical way to understand the kind of archaeological work that other urban studies can do for the Maya. This research intends to provide a scholarly inquiry of Maya urbanization. Second, by making distinctions of archaeological analysis, methodological implications, and theoretical models discussed in literature, I will extend my evaluation to note challenges about research designs and how they can improve. Currently, a lack of excavation data has not been sufficient enough to provide more archaeological context to the arguments made about social landscapes. The absence of this data has made it difficult for researchers to define Maya urbanization. A solution might entail further research on theoretical applications in a urbanized landscape, with supportive data from excavated archaeological sites. This research demonstrates the effect that excavation has on the Maya, from a critical analysis of urban study works, along with discussions from other studies of urbanization that ultimately, include substantial excavation data in these studies to support Maya urbanization.

Douglas, Allison (University of Oklahoma)

[43]

Discussant

Douglas, Peter and Benjamin Keenan (McGill University)

[128]

Climate Change during the Preclassic to Classic Transition in the Maya Lowlands

There is great interest in the possible role of climate change in Lowland Maya sociopolitical transitions. Much of this interest has focused on the Terminal Classic, but recent research has also highlighted substantial climate shifts at the Preclassic-Classical transition. Specifically, there is evidence for a prolonged period of wet conditions from ca. 700 to 0 BCE, spanning much of the Middle and Late Preclassic. After 0 BCE climate records indicate both drying and greater decadal-scale climate variability, culminating in a drier mean climate during the early Classic period. While quantifying and dating this climate shifts remains a work in progress, it represents a clear signal of environmental change that should be accounted for in archaeological conversations surrounding the Preclassic–Classic transition. We will discuss the different paleoclimate archives and proxy methods, their sources of uncertainty, and the possibility for significant spatial variation in climate signals. We will then propose a synthetic view of climate change across the Preclassic–Classic transition that takes into account these aspects of the paleoclimate data. Finally, We will discuss the potential for analyzing signals of human activity in sedimentary archives from the Maya Lowlands, which could provide clearer linkages between evidence for climatic and societal change.

Douglass, John (Statistical Research Inc.) and Susan Chandler (Alpine Archaeological Consultants)

[58]

The Founding of Modern CRM Archaeology

Cultural resource management (CRM) is a field that, while begun principally as university-based programs in the 1970s, has its modern foundation in the 1970s and 1980s among founders of privately held firms. Through time, the number of private CRM firms has grown immensely, whereas the number of university-based CRM programs has declined. Early on, CRM firms focused almost strictly on archaeology, but today's CRM encompasses a much wider range of opportunities for clients. This introductory paper offers a background to this session on the founding of CRM firms in North America and a context for the papers to come.

[58]

Chair

Douglass, John (Statistical Research Inc.)**[87]***Discussant*

Douglass, Kristina [76] see Hixon, Sean

Dove, David**[149]***The Evolution of a Great House: Monumental Constructions, Feasting, and the Acquisition of Power in the Central Montezuma Valley*

The Montezuma Valley of southwestern Colorado lacks permanent and reliable water sources which made Mitchell Springs a popular central valley stop. Permanent residency began by AD 650 and by 1100 it had grown into an extensive catchment-wide community containing multiple great houses. Its six-century longevity was closely tied to environmental and topographical conditions in its watershed. Dry-land farming at the low elevations of the central valley has rarely been possible which led to the creation of robust runoff-diversion irrigation systems. These systems contributed to the development of several powerful house-based production-groups. Two such groups established residency near the springs in the early days of the community and they remained there for centuries. The monumental constructions they built and the ritualized feasts they hosted are central features of this poster. Unusually large suites of rooms with copious ritual features were built to store, prepare and sanctify the feast food. Two hundred years later, after their arc-shaped pueblos were decommissioned, a great house with an appended tri-wall was built there. The functions that took place there over centuries greatly contributed to raising the stature of these ancestral architectural creations and the space they were built on, to that of a shrine.

Dowling, Katherin [9] see Wholey, Heather

Downum, Christian (Northern Arizona University)**[255]***"Localized and Uneven": A Comparative Analysis of Sinagua and Cohonina Foodways*

The Fire Foodways Model proposed by Alan Sullivan and colleagues represents a major challenge to traditional models of maize dependence for upland populations of the ancient Southwest. This paper examines direct and indirect evidence for the cultivation of maize and other domesticates in the San Francisco Peaks region of northern Arizona and compares the subsistence economies of two ancient populations archaeologists have labeled Sinagua and Cohonina. Although both groups often shared similar environments of forest, scrublands, and high desert grasslands, evidence points to substantial differences in their foodways. The Fire Foodways Model is supported in part, but cultivation of a variety of domesticates was a significant pursuit for populations living in areas where irrigation, floodwater, and recession agriculture were possible. This is especially true after about AD 1100, when cotton becomes an important part of local economies and ritual spaces. The paper also examines recent faunal analyses, which further highlight the localized and uneven nature of foodways across the region.

Doyle, Colin (University of Texas, Austin), Timothy Beach (University of Texas, Austin) and Sheryl Luzzadder-Beach (University of Texas, Austin)**[230]***Lidar and Multiproxy Evidence for Intensive Maya Wetland Agriculture along the Rio Bravo*

We present results from a newly discovered Maya wetland raised field system found along the Rio Bravo in northwest Belize using airborne lidar. The lidar data reveal canals and fields in a very rectilinear pattern covering ~7 km² of the floodplain. In the summers of 2018 and 2019, we surveyed the canals on the ground and conducted seven excavations in the raised fields and canals. In all of the raised field excavations, we found a paleosol ~1 m below the surface, similar to other systems in the region, with a second paleosol in one excavation ~3.5 m below the surface. In this study, we present stratigraphy, radiocarbon dates, elemental geochemistry, and stable isotopes to reconstruct the environmental history and constrain the chronology of the ancient fields and canals. We then apply machine-learning techniques to the lidar to automatically extract and measure individual fields and the total extent of the system. Lastly, we use water chemistry and hydrological modeling with the lidar to identify potential water quality and quantity management of the canals. The combination of the in situ, remotely sensed, and laboratory data gives us insight into the timing and functionality of this expansive ancient agricultural system.

Doyle, Colin [8] see Casal, Fernando

Doyle, Colin [206] see Dale, Jedidiah

Dozier, Crystal (Wichita State University), Angelina Perrotti (Arkansas Tech University) and Elayne Rye (Wichita State University)**[8]***Effects of Acetolysis on Starch Granules*

The ability to co-currently analyze multiple microfossils from the same paleoecological or archaeological sample would allow for faster and multi-evidenced analyses. However, most microfossils require chemical processing in order to become identifiable under different types of microscopy; acetolysis is commonly employed in palynological study. We present the effects of acetolysis on four starch taxa. Acetolysis differentially effects starch granule morphology. While all of the native (undamaged) starches were unaltered from acetolysis, the exterior texture of two ground (damaged) starch taxa were further impacted after acetolysis. Acetolysis did not

significantly impact starch size measurements. The capacity to conduct starch analysis from acetolyzed samples is discussed for archaeological and paleoecological study.

Dozier, Crystal [198] see Haley, Cambria

Drake, Lee [5] see Davis, Mary
Drake, Lee [203] see Kelly, Nigel

Drake, Stacy (Field Museum), Lauri Thompson (Center for Archaeological and Tropical Studies) and Julie Saul (Center for Archaeological and Tropical Studies)

[53]

Exploring Ritual through Mortuary Practices and Community Influence on Burials from Northwest Belize

The practice of burying the dead is often interpreted by anthropologists as one that is imbued with social meaning. Within Maya archaeology, mortuary data is used to inform interpretations of the social and economic standing of both the decedent and the greater community within which the burial is located. Using aggregate data from approximately 150 human burials recovered throughout the Three Rivers Region of northwest Belize, this paper considers the ways in which data for mortuary ritual may inform conceptions of social and economic practices of the region's ancient Maya inhabitants. The authors start with a broad, interregional introduction of common mortuary characteristics encountered from burials that represent 2000 years of Maya occupation at 12 archaeological sites. The focus then narrows to explore burials from the small hinterland community of Medicinal Trail. With its multiple household groups representing varying time periods, Medicinal Trail serves as a great case-study for investigations of possible social, economic, and ritual influences behind shifting treatments of the dead. By emphasizing holistic mortuary data from both large- and small-scale settings, the authors hope to contribute to conversations of changes and fluctuations in socio-cultural beliefs, ritual practices, and economic standing of Maya communities through time and space.

Drake, Stacy (Field Museum)

[153]

Discussant

Drake, Stacy (Field Museum)

[218]

Moderator

Dreibrodt, Stefan [85] see Martini, Sarah

Drew, Brooke (Indiana State University/Cardno)

[167]

Coffins, Burial Cases, and Caskets: Coffin Hardware and Other Material Culture from a Nineteenth-Century Indiana Cemetery

The number of archaeologically excavated historic period cemeteries has increased significantly in recent years. Due to the hard work of many dedicated scholars, we now not only have robust chronologies for nineteenth century mortuary material culture, but we have a more nuanced understanding of the beautification of death movement that prompted the proliferation of decorative coffin fittings. The coffin hardware recovered during the Bethel Cemetery Relocation Project is indicative of a community that, though small and rural in nature, was heavily influenced by this movement. This assemblage includes a surprisingly varied collection of handles, thumbscrews, and coffin plaques as well as other ornamental fittings typical of the period. Useful in establishing likely dates of interment for unmarked burials, these materials allow us to contextualize mortuary behavior in this community through time. Additionally, and perhaps more importantly, these temporal data make it possible to identify individuals whose markers have been lost or misplaced. These identifications are important not only to the archaeologists investigating the cemetery but also to the descendant community that has been actively involved in its relocation. Other artifact categories like clothing-related items, personal adornment, and personal items, though far less numerous and varied, will also be discussed.

[167]

Chair

Drew, Brooke [167] see Herzog, Hunter

Drosou, Konstantina [212] see Harvey, Virginia

Drucker, Dorothée [162] see Wong, Gillian

Druggan, Patrick (Penn State University)

[264]

The Bounty of Woodland Ohio: Reconstructing Resource Distributions through Time and Their Implications for Subsistence and Settlement

Ohio's Woodland societies have long attracted archaeological attention due to the magnificent scale and complexity of their ceremonial landscape; however, advances in the understanding of their subsistence and settlement systems have largely lagged

behind those of their ceremonial sphere. This has been particularly hampered by limited habitation excavation and potential low visibility of these sites. This paper synthesizes available paleoenvironmental data and uses species distribution modeling to assess diachronic trends in the distribution and availability of economically important plants. Distributional changes are reviewed with respect to maximum entropy modeling of habitation locations and recovered paleoethnobotanical data in order to correlate environmental parameters with the adaptive strategies embodied in settlement patterns and subsistence economies. This paper closes by discussing uncertainties related to presently available data.

Duarte, Ricardo (Eduardo Mondlane University-CAIRIM) and Yolanda Duarte (Eduardo Mondlane University-CAIRIM)
[273]

Mozambican Maritime Landscapes of Slaving and Exchange: New Directions

This paper focuses on ongoing and emergent archaeological investigations that are opening new vistas on Mozambique Island's global maritime interactions over the last millennium. Providing a brief overview of the program of collaboration between the Slave Wrecks Project and Eduardo Mondlane University that investigates submerged sites in conjunction with terrestrial ones in order to build a picture of an evolving "maritime landscape of slaving and exchange", this presentation will highlight recent findings on two of these sites which offer different levels of resolution on Mozambique's global maritime past: an "Arringa" in the remote Tete interior from which slaves were funneled through the Island into both Atlantic and Indian Ocean trades at the end of the eighteenth century; and a site on the Island itself that is recalibrating our understanding of over a millennium of Mozambican trade and social interaction across the Indian, and later Atlantic, Oceans.

Duarte, Ricardo [273] see Lubkemann, Stephen

Duarte, Trevor (Kamehameha Schools), Jon Tulchin (Kamehameha Schools) and Charmaine Wong (Bernice Pauahi Bishop Museum)
[186]

Nā Makau o Wai'ahukini (The Fishhooks of Wai'ahukini)

Located in Pakini Iki ahupua'a (traditional land division) of Hawai'i Island, Wai'ahukini Village is nestled in a shoreline kipuka (void between lava flows). The wealth of fishhook and faunal remains found at Wai'ahukini Rockshelter (H8)—a dwelling site within the village complex—indicates that this location was used extensively for fishhook processing. Initially occupied in the fourteenth century, Wai'ahukini Rockshelter was utilized by traditional Hawaiian tool makers to craft a range of shell and bone fishhooks that exhibit an evolution in style from notched to knobbed shafts. The presence of metal fishhooks in the assemblage also reveals that the site was still being used following European contact. The collection of over 1,000 fishhooks recovered, as well as faunal remains in the form of fish bones, reflect the diversity of fish caught in this region which spans 500 years. This display was created by the Spring 2018 cohort of the Kamehameha Schools (KS)-Bishop Museum archaeology collections internship program. The program assists with updating current curation standards of Bishop Museum's archaeology collections, focusing on materials that were collected from KS' ancestral landholdings. Program outcomes highlight a commitment to stewarding koehana (artifacts) for future generations and support of career pathways in cultural resource management.

Duarte, Trevor [262] see Filimoehala, Darby

Duarte, Yolanda [273] see Duarte, Ricardo

Dubied, Morgane [17] see Selden Jr., Robert

Dubois, Jonathan (Cal State San Bernardino)
[127]

Linked by the Living Land: Cacao as a Relational Agent in Intercontinental Interactions during the Formative Era

Recent studies have demonstrated that cacao, an economically important plant with an established symbolic and ceremonial program surrounding it in Classic Mesoamerica, was likely domesticated in Northwestern South America. This paper will explore the relationship between symbolism relating to cacao in both places through an examination of iconographic representations in South America that precede the appearance of similar images in Mesoamerica, where the iconographic corpus is better understood. I propose that an intercontinental network of interaction existed during the Formative that featured not only the exchange of material goods like cacao, maize, and spondylus, but also the knowledge of how to better integrate them into the social and ceremonial lives of the peoples who adopted them. This network would have been facilitated by shared ontological understandings that were relational and that included a recognition of diverse "other-than-human" beings, including the plants and animals being exchanged, who were agents capable of acting on their own behalf. They would have required not only the particular environmental conditions needed to thrive that we acknowledge today, but as relational entities they would also have needed certain ceremonies, offerings, and other practices intended to honor their role in a changing cosmological landscape.

Dubois, Katherine (University of New Hampshire) and Amy Michael (University of New Hampshire)
[212]

Reconstructing Migration to Caesarea Maritima: Bioarchaeological Analyses of Adult and Child Burials Using Strontium Isotopes
Caesarea Maritima, a long-term habitation site in the geopolitical borders of Israel, was originally built for Roman occupation. Muslim conquest and subsequent re-fortification of the site by Crusaders contributes to its complex mortuary practices. Salvage operations in 1980 yielded hundreds of commingled and primary burials. Currently, University of New Hampshire and Michigan State University

curate the Caesarea Maritima skeletal collection comprised of individuals of varied religious and ethnic identities. The purpose of this research was to determine the geographic origin of individuals in the collection. The individuals were classified Christian, Muslim or Crusader by burial position, but because there are few original notes regarding mortuary ritual and religious affiliation (and grave goods were separated from individuals during excavation), little is known about these peoples beyond basic biological profiles. The signature/abundance of strontium isotopes in sampled teeth was analyzed and compared to existing isotope maps of Israel. Using a micro-spatial sampling method on the permanent incisors and second molars revealed more refined information about specific ages of migration. The results demonstrated that individuals were of mixed origin. This research increased understanding of the lives of the twelfth century individuals and provided the first bioarchaeological study of them in 35 years.

Dudgeon, John (Idaho State University, CAMAS)

[237]

The Empirical Standard: Creating Archaeological Explanations That Are Both Data-Driven and Testable

It has been nearly 20 years since the award of Hector Neff's NSF archaeometry grant, "What [More] Can LA-ICP-MS Do for Archaeology?" While small by current funding standards, this grant paved the way for a generation of archaeologists to confidently ask empirically-testable research questions about archaeological materials. From geochemical and biogeochemical provenance to environmental formation process studies and more, this visiting researcher program focused on access to analytical tools to address these questions, but also was driven by an overriding concern for the reliability and validity of archaeological data created by these tools and how the result is utilized to test archaeological hypotheses. A review of the literature either created by or informed by the research program of Hector Neff demonstrates a clear and consistent application of an empirical standard underpinning an interest in creating archaeological and anthropological explanations of more general relevance in the field. Far from being a mere "technician" of archaeological method, Neff's legacy of theoretical and methodological contributions demonstrate the importance of precise and accurate articulation of empirical data with models for explaining human behavior and observations of change in the archaeological material record.

Dudgeon, John [240] see Blatt, Samantha
Dudgeon, John [236] see Kumm, Ethan
Dudgeon, John [270] see Peterson, Kateea
Dudgeon, John [120] see Rakowski, Rebekah
Dudgeon, John [80] see Simmons, Wilson

Dudley, Meghan (University of Oklahoma)

[65]

Archaic House Pits in the Rocky Mountains: What Do We Know about Them Today?

Pit structures (frequently referred to as "house pits" or "pit houses") occur throughout the Central and Southern Rocky Mountains during the Archaic era (8,600–1,350 BP). Despite their long tenure in the archaeological record and despite being the only evidence for permanent Rocky Mountain hunter-gatherer shelters during that time, the most recent synthesis was compiled by Lane Shields for a master's thesis in 1998. Based on a literature review and records search, this poster updates Shields's synthesis, focusing on pit structures documented over the past 20 years and new trends in their interpretation.

Dudley, Meghan [97] see Newton, Kathryn

Duffy, Lisa (University of Florida)

[150]

Metabolomics in the Study of Ground Stone Tools

Archaeological ground stone tools used for food processing have proven to be rich sources of residues, in particular microbotanicals such as pollen, phytoliths, and starch grains. This data adds to the studies of tool function, foodways, and other lines of archaeological inquiry. To date, ground stone has not been the target of chemical residue analysis, specifically metabolomic analysis via liquid chromatography–mass spectrometry (LC-MS) in the pursuit of ancient food residues. For this study, ground stone artifacts from ancient Maya sites in Belize and Guatemala were evaluated to determine whether this type of organic residue analysis is successful in recovering chemical signatures. UHPLC-HRMS was utilized and a variety of metabolites of interest were identified. Compounds recovered included carbohydrates, alkaloids, fatty acids, and other metabolites with the potential to inform on a variety of food resources. These results demonstrate the utility of ground stone artifacts as potential resources for recovery of metabolites important to the study of ancient foodways.

Duffy, Lisa [54] see Emery, Kitty

Duffy, Paul [135] see Boric, Dusan

Dufresne, Philippe [24] see Lanos, Philippe

Duggins, Julie (PaleoWest)

[193]

Educating Politicians: Outreach and Advocacy behind the Front Lines

PaleoWest demonstrates leadership in outreach through political advocacy at the local, state, and federal levels of lawmaking.

Taking action on multiple levels and working behind the scenes, we shape public policy to meet industry needs. This paper will discuss examples of our efforts and provide a blueprint for other CRM professionals to make similar contributions. Successes at the local ordinance level in Florida have been realized through engagement with commissioners and the mayor. PaleoWest lobbied Congress to provide adequate funding to the nation's largest Federally-funded archaeological project, resulting in the New Mexico Navajo Water Settlement Technical Corrections Act. Nationwide advocacy aims to improve legislation and procedures impacting archaeological consulting. In contrast to outreach "on the front lines," which often aims to reach interested members of the public, retirees, and the next generation, political advocacy represents outreach focused on decision-makers who shape public policy. Policy-oriented outreach occurs through strategic placement of ideas via formal and informal work with politicians, ground-level movers and shakers, and other professionals in archaeology. Through concerted efforts, such as the examples provided in this paper, measurable strides have been made to mold local codes, state laws, and nationwide regulation in favor of our profession's goals.

Duggins, Ryan (Bureau of Archaeological Research) and Heather Walsh-Haney (Florida Gulf Coast University)

[18]

Inundated Wet-Site Archaeology: Manasota Key Offshore and the Future of Submerged Precontact Archaeology on the Continental Shelf

Delicate precontact archaeological materials located within stratified sediments withstood Holocene sea level rise and survived thousands of years in the Gulf of Mexico. Manasota Key Offshore (8SO7030) is a Middle Archaic mortuary pond that rests in the nearshore waters of Sarasota County, Florida. Archaeological investigations documented the preservation of prehistoric organic materials including worked wood, cordage, and the remains of at least 11 individuals (including prenatal, juvenile, adult and geriatric adults). Research at Manasota Key Offshore focused on identifying the boundaries of the inundated paleopond and determining the extent and preservation of archaeological material. This unique site provides a window into Florida's changing landscapes, particularly in relation to prehistoric and contemporary sea level rise and subsequent human responses. The Manasota Key Offshore site contains an abundance of in-situ archaeological material, challenging generations of archaeological attitudes that questioned the survival of submerged sites on the continental shelf and the benefit of their study. This research has the potential to guide state and federal cultural resource managers in the identification and protection of submerged cultural resources located across the country's continental shelves.

[18]

Chair

Duguid, Danielle and Jake Lulewicz (Washington University, St. Louis)

[77]

Using Elevation and the Floodplain to Analyze the Settlement and Abandonment of Sites in the Lower Illinois River Valley

Humans living in the Lower Illinois River Valley have always had their lives impacted by the waterways that cut through the valley. By examining the settlement patterns of different populations through time, we can view a glimpse of their relationship with these bodies of water. Utilizing location data in relation to the Lower Illinois River, I have analyzed changing patterns of occupation and continuity of sites. This was accomplished by using the site elevation, occupation and abandonment, and number of sites in the floodplain for each period to identify changing patterns through time. Results show how groups were moving in relation to altitude and the floodplain, including evidence that precolumbian occupation periods consistently abandon sites of higher elevations and continue to live at lower levels, while in post-contact occupation periods this trend reverses.

Duke, C. Trevor (University of Florida), Neill Wallis (Florida Museum of Natural History) and Ann Cordell (Florida Museum of Natural History)

[123]

Networks of Embodied Practice: Personhood, the Body, and Potting Skill in the North American Southeast

Archaeologists over the last two decades have become increasingly interested in the relationship between personhood and the human body. Bodily engagement with the material world can create and reproduce different kinds of social understandings, and is a means by which persons make subjectivity durable, transmissible, and experiential. While case studies of personhood have generally been beneficial for the field of archaeology, few have focused on how differences in skill level can impact self-categorization. For instance, part-time potters may not self-identify specifically as "potters." Conversely, specialized mortuary potters that received years, perhaps decades, of hands-on training are much more likely to identify with their craft. We use metrics and value scores to evaluate differences in potting skill from Late Woodland (ca. AD 650–1050) and Mississippian (ca. AD 1050–1550) mortuary contexts in the Tampa Bay region. We also employ petrography and Neutron Activation Analysis (NAA) to identify where across the southeastern landscape these differences in skill occurred. We argue that while specialized mortuary potters were present during both the Late Woodland and Mississippian Periods, they put their skill to use for different purposes due to changes in social networks, and thus became fundamentally different kinds of social subjects.

[123]

Chair

Duke, C. Trevor [123] see Sorresso, Dominique

Duke, Daron [5] see Davis, Mary

Duke, Daron [8] see Rice, Sarah

Duke, Guy [257] see Rowe, Sarah

Dull, Robert

[90]

Discussant

Dumouchel, Laurence [27] see Pobiner, Briana

Dunbar, James (Aucilla Research Institute Inc.) and Jessica Cook-Hale (Emory University)

[30]

Corrosion and Weathering in Lithics from Submerged Contexts: Problems, Potentials, and Future Ways Forward

Lithics from both submerged and terrestrial contexts are often corroded and weathered. It is clear that postdepositional conditions are responsible for these changes, but it is not clear if the geochemistry of this corrosion/weathering can be characterized with enough detail to link lithic artifacts to specific conditions such as a sediment type or even watershed. We present here a study for proof of concept using scanning electron microscopy and energy dispersive spectrometry to test a large sample suite of lithics from submerged sites, both freshwater and marine. Results are mixed but suggest potential future ways forward for analysis of postdepositional processes using these corrosion/weathering materials.

Duncan, James [47] see Diaz-Granados, Carol

Duncan, Joshua (Texas State University) and Todd Ahlman (Texas State University)

[215]

European Ceramics in the Caribbean: A Glimpse of Globalization during the Colonial Era

The Caribbean island of St. Eustatius (Statia) was a free port for much of the seventeenth and eighteenth centuries where the forces of globalization, such as people, resources, commodities, and ideas moved unceasingly, altering the world as it was and pushing it closer toward the world we know today. Through the Colonial period, Statia profited from the successes of the Dutch "Golden Age", the Industrial Revolution in Britain, and the American Revolution, and once housed goods from around the world in its 200+ warehouses. Statia has remained largely untouched by tourism and development and the island's archaeological record remains mostly intact, meaning that it is literally covered with colonial era artifacts. This poster examines ceramic artifacts from recent investigations at an industrial sugar complex to understand the origins of modern globalization and mass-consumerism as they emerged in the region and shifted throughout the Colonial period. Ceramic assemblages from Dutch and British Caribbean sites were compared to the Statian artifacts to address whether any differences or similarities existed between Dutch and British consumerism during this period.

Duncan, Marjorie [23] see Lohse, Jon

Duncan, Neil [4] see Young, Danielle

Dungan, Katherine (Arizona State University)

[136]

Chair

Dungan, Katherine (Arizona State University)

[156]

Great Kivas, Religion, and Society in the Mogollon Highlands after AD 1000

Great kivas, with their long history of archaeological investigation and massive size, are both the best-known and most obviously communal of Mogollon non-domestic structures. In this paper, I consider these buildings specifically as "religious" architecture and argue that grappling with anthropological conceptualizations of religion can add new dimensions to our understanding of great kivas, their artifact assemblages, and the—potentially political—place of these structures in their society. This discussion draws in particular on a study of great kivas in the Mogollon Highlands after around AD 1000, including museum collections research that demonstrates previously unrecognized patterns in great kiva assemblages.

Dunne, Jennifer [26] see Crabtree, Stefani

Dunning, Nicholas (University of Cincinnati)

[128]

Redundancy, Restoration, and Resilience: Ancient Maya Civilization's Crash and Recovery in the Terminal Preclassic

The Terminal Preclassic period in Maya Civilization was a time of considerable change brought on in part by environmental degradation and drought. Within the Elevated Interior Region (EIR) problems were especially acute due to the reservoir effect, a cycle of dependency and vulnerability associated with the regional water management system. Many EIR cities declined and some were abandoned. Recovery into the Classic period was accomplished in part by stabilization and restoration of degraded soils, and by adding greater redundancy to water collection and storage systems—a strategy that would ultimately see the reservoir effect again play havoc in EIR urban centers in the Terminal Classic.

Dunning, Nicholas [20] see Carr, Christopher
 Dunning, Nicholas [206] see Luzzadder-Beach, Sheryl

Dunsmore, Erin (Tennessee Valley Authority)
[208]
Discussant

Durand, Karen [143] see Weaver, Brendan

Durham, Jordan, Elizabeth Hagan (University of Louisville) and Amanuel Beyin (University of Louisville)
[36]

Evaluating the Performance of Hand-Thrown Spears Experimentally by Controlling Shaft Length

The invention of hand-thrown spears technology displayed a cognitively-based cultural invention that allowed humans to hunt prey from a distance. The technological innovation of hand-thrown spears allowed for humans to reduce the risk of fatal injuries when encountering dangerous prey. This project will replicate projectile spear throwing to compare the variation in shaft length among groups to determine how the different distances achieved can be indicative of shaft preference. Our experiment will re-create hand-thrown spears and test distance achieved comparable to variations in shaft length, lethality, and accuracy. Our methodological approach will comprise of groups of experienced and non-experienced throwers of various height and weight that will throw spears at mid-range prey, model deer, to control effectiveness of hand-thrown spears from various distances and shaft lengths. Hand-thrown spears have been traditionally made of perishable materials, such as wood, and therefore will not remain intact in the archaeological record. This experiment will contribute to the broader debate whether variation in shaft length affects distance achieved. Variation in hand-thrown spear length could affect prehistoric decisions of what ecosystem to inhabit—due to availability of hafting material, apt size prey for projectile technology use, and the environmental suitability to maintain human fitness.

Dussubieux, Laure (Field Museum of Natural History)
[249]

Glass Trade in the Indian Ocean: A View from Southeast Asia

Glass beads are long-distance trade items that are found all over the Indian Ocean. They appear in Southeast Asia around the middle of the first millennium BC. Looking at the elemental composition of the glass beads, it is possible to identify connections between Southeast Asia and the rest of the Indian Ocean, with important changes through time. Early on, we observe that South and Southeast Asia form an exchange sphere of its own. Toward the end of the first millennium AD, a shift occurs and a larger network appears with similar glass beads manufactured in South Asia found in Southeast Asia and Africa. Recent research is showing that, later, in the second millennium AD, the evolution of this network is visible in both regions through similar changes in glass bead types. We will discuss the implications of our research in terms of trade but also in terms of glass and glass bead production around the Indian Ocean.

[249]
Chair

Dussubieux, Laure [249] see Sarathi, Akshay

Duwe, Sam (University of Oklahoma)
[148]

Nuute'owingeh: Complicating our Understanding of Historic Period Pueblo Settlement in the Northern Rio Grande

Between the sixteenth and seventeenth centuries the settlement patterns of the Pueblo world of northern New Mexico fundamentally shifted. The 'abandonment' of much of the Pueblo's traditional homeland, and the subsequent coalescence of people in large villages along the Rio Grande and its major tributaries, has long sparked interest from archaeologists and historians. Was this movement the continuation of a centuries-long process of Pueblo coalescence, or rather a response to early Spanish contact and colonization? If the latter, what kinds of negotiations and tensions arose in the contestation of landscape between these disparate peoples? And, how have Pueblo people maintained ties with their sacred places in the face of dramatic changes in land access and ownership? I explore the complicated history of Nuute'owingeh, an ancestral Tewa village located in the Rio Chama valley that was until recently thought to be lost to development. The village offers a unique opportunity to address these questions because it sporadically housed Tewa people from the thirteenth through eighteenth centuries, spanning Prehispanic time, the period of Spanish contact and initial colonization, and the Pueblo Revolt and its aftermath. I discuss new data from aerial reconnaissance of architecture and the analysis pottery and lithic material culture.

Dye, David (University of Memphis)
[166]

Mississippian and Oneota Interaction in the Lower Mississippi Valley

Oneota interactions with Mississippians are typically characterized by violence and warfare, often resulting in population replacement, with Oneota people forcing Mississippians from their territories. Mississippians in the Lower Mississippi Valley may have comprised a sufficiently large territorial bloc to have successfully thwarted Oneota population movements and aggression. In this paper I suggest Mississippian-Oneota interactions during the Early Contact period were sedimented in rituals resembling the calumet ceremonies of the eighteenth century. Oneota motifs on Lower Mississippi Valley ceramic bottles and the presence of disk-style pipes, offer compelling evidence of ritual-based protocols that allowed mutually beneficial interactions to take place between

neighboring Mississippian and Oneota people.

Dye, Thomas (University of Hawai'i)

[24]

Reasoning between the Lines: Archaeological Application of Allen's Interval Algebra

A technique for inductive correlation of time intervals represented by archaeological contexts on separate lines of a Harris matrix is described and illustrated. Unlike two distinct contexts on the same line of the Harris matrix, which represent intervals that must be earlier and later than one another, contexts on separate lines potentially represent concurrent intervals. R software is used to explore application of Allen's interval algebra to the indefinite intervals yielded by Bayesian calibration. Potential benefits include (1) precise description of the relationship between intervals yielded by dated contexts on separate lines of the Harris matrix and (2) using the algebra to infer the relationship between an interval represented by a dated context on one line of the matrix and an interval represented by an undated context on another line with a dated context.

[24]

Chair

Dye, Thomas [24] see Moody, Bryony

Dyke, Arthur [64] see Szpak, Paul

Dylla, Emily (Texas Historical Commission)

[239]

Men of the Mission: Creating and Contesting Male Personhood on the Last Spanish Colonial Frontier

Gender roles were a particularly visible aspect of Spanish missionization in Alta California. Part of the worldview Franciscan missionaries attempted to impart to Indigenous neophyte communities was a particular model of male personhood, rooted in medieval European ideology. Indigenous neophytes and non-ecclesiastical colonizers embodied alternative models to this, however. This paper examines how male personhood was constructed and contested within the pluralistic mission community of San Antonio de Padua. I examine and compare two all-male mission households occupied respectively by unmarried neophytes and colonizing soldiers assigned to guard the mission.

Ea, Darith [168] see Stark, Miriam

Eagle, Jon (Standing Rock Sioux Tribe)

[44]

Discussant

Earley, Caitlin (University of Nevada, Reno)

[265]

Warfare, Sacrifice, and the Captive Body in Classic Maya Sculpture

In the Late Classic period, images of captives on carved stone monuments populated ancient Maya site centers. Usually described as war prisoners, these captives appear bound, subjugated, and downtrodden, often by powerful kings. In this paper I examine how images of captives affected the lived experience of warfare for ancient Maya people. Based on a study of captive imagery from throughout the Maya area, I incorporate art historical, archaeological, and historical data to argue that depictions of captives reveal information about how people prepared for and responded to warfare. In particular, I disentangle the link between captivity and sacrifice, examining how captives—and images of captives—were key players in administering the outcomes of war. Examining the defeated rather than the victorious, this paper opens up a fuller range of human experience in the ancient Maya world, revealing how warfare-related imagery affected the lives of diverse individuals in Classic Maya centers.

Earley, Frank and Thomas Huffman (University of the Witwatersrand, Johannesburg)

[60]

Puebloan Rock Art and the Spanish Peaks, Southeastern Colorado

Most researchers see the Sopris archaeological entity, near Trinidad, Colorado, as hunter-gatherers influenced by Pueblo people through trade. We argue that Sopris people were Eastern Puebloan and probably spoke a Tanoan language. The Eastern Puebloan worldview provides the context to interpret rock art in the Sopris area. Ethnographically, origin myths provided the charter for social, religious, and spatial organization. Among other things, sets of twin deities (one for each moiety) emerged from a sacred lake and discovered mountains in the four cardinal directions, which rose from the earth and were therefore igneous. The twin deities took mud from the wet earth and created sedimentary hills and mesas which stand between the sacred mountains and the lake of origin. These mountains were in a series of concentric zones that circumscribed the Eastern Pueblo world. The sacred mountains formed the furthest zone (zone 4), and it was here that priests went to "earth navels" to ask the twin deities for rain. Other shrines located in the hills (zone 3) were deer-earth navels where people asked for supernatural help with hunting. Rock art on the East Spanish Peak northwest of Sopris and near the headwaters of the Purgatoire River are thus explicable.

Easton, Norm [198] see Grooms, Michael

Eberl, Markus [232] see Johnson, Phyllis

Ebert, Claire (Northern Arizona University)

[128]

Resilience and Local Dietary Adaptations in the Protoclassic Maya Lowlands

Maya archaeologists are increasingly focused on understanding the factors that promoted resilience during the transition from the Preclassic to Classic period (100 BC–AD 300). While many large centers declined, others flourished for another six to seven centuries. This study brings together stable isotope paleo-dietary data from across the Maya lowlands to document this transition at the individual level. These data indicate that by 900 BC, settled Maya farmers possessed broad subsistence strategies that focused on both domesticated and wild foods. Wetter conditions beginning around 600 BC promoted reliance on maize as a staple crop, and consequently the proliferation of large centers in the Petén and Pasión regions of Guatemala. Individuals living in northern and western Belize possessed broader diets that also included marine and freshwater resources. This diversity of foods may have helped to absorb shocks to maize production in the context of severe multi-century drought between ~AD 100 and 300. People living in some parts the Petén, which lacks large bodies of surface water, were likely more vulnerable to impacts on drought-intolerant crops like maize. These conditions may have contributed to the decline of many major centers in this area of the lowlands after AD 100.

Ebert, Claire [168] see Awe, Jaime

Ebert, Claire [130] see Fitzmaurice, Rosamund

Ebert, Claire [230] see Hoggarth, Julie

Ebert, Claire [26] see Ortman, Scott

Ebert, Claire [158] see Watkins, Tia

Ebert, Julia (German Archaeological Institute), Paul Cheetham (Bournemouth University), Friedrich Lüth (German Archaeological Institute) and Behrens Anja (German Archaeological Institute)

[107]

An Early and Middle Neolithic Ritual Landscape in Northeast Germany: Survey and Excavations on Monumental Structures of the Funnel Beaker Culture in Western Mecklenburg

In the framework of the Priority Program 1400 “Early Monumentality and Social Differentiation” funded by the German Research Foundation, geophysical prospections, as well as excavations have been conducted on and around several Neolithic enclosures and burial monuments in the region of Western Mecklenburg since 2009 by the German Archaeological Institute. The results of the geomagnetic, as well as geoelectric and ground-penetrating radar surveys have served to enhance and complement aerial photographs and LIDAR data, as well as to detect previously unknown structures in the landscape. At the same time, they also highlight the challenges of interpreting magnetic data obtained in glacially formed landscapes. Subsequent excavations at selected sites, such as the megalithic burial complex of Friedrichsruhe or the Gädebehn 10 ditch enclosure, have revealed detailed formation histories and numerous material remains. The research results provide important new insights into the Early and Middle Neolithic social and ritual landscape in this part of northeast Germany. They also serve to answer questions relating to the chronological development of the Funnel Beaker Culture and cultural relations between the investigated sites and previously known, significant sites in the region, such as the flat-grave cemetery of Ostorf-Tannenwerder.

Eche Vega, J. Eduardo [105] see Cuello del Pozo, Paloma

Eck, David [186] see Tsesmeli, Evangelia

Eckert, Suzanne [172] see MacFarland, Kathryn

Eckert, Suzanne [203] see Schaefer, Jonathan

Eddy, Zoe (Harvard University)

[41]

Indigenous Archaeology, the Seventh Generation

This symposium will highlight up and coming indigenous scholars' work within the growing paradigm of indigenous archaeology. Though archaeologists have begun to adopt and include indigenous practices in the field of archaeology, only recently have indigenous people begun to include their own cultural methods and practices as archaeologists. Growing on the foundational work of scholars such as Joe Watkins and Sonya Atalay, this symposium will be a discussion of the future directions of indigenous archaeology. My participation in this symposium will highlight the work being done in museums to create indigenous spaces as well as use indigenous curatorial practices. I will discuss and examine how, while museums will never be fully decolonized, they can serve as spaces of rupture, renegotiation, and reconciliation.

Edelstein, Beth (Cleveland Museum of Art), Adriana Rizzo (Metropolitan Museum of Art) and Sue Bergh (Cleveland Museum of Art)

[258]

Investigation of Adhesive Resins on Wari Attributed Objects

Between AD 600 and 1000, the Wari created a civilization so complex that many today identify it as the ancient Andes' first empire.

Wari objects seem to have been coveted all over the region for their imagery, precious materials, fine execution, and affiliation with Wari might. Among them are inlaid objects whose adhesives have not been well studied. This paper examines Wari objects in the collection of the Cleveland Museum of Art and the Museum of Fine Arts Houston in the interest of identifying the resinous material used to adhere shell to stone. These resins appear similar to the eye in color, luster and fracture and have a similar hardness. The three samples are currently undergoing analysis with FT-IR, THM GC-MS and Py-GC-MS at the Metropolitan Museum of Art. Initial results revealed a similarity between one sample and a previously-analyzed though not yet identified resin found as a paint binder in a group of Paracas ceramics (see Kriss et al, 2018). The potential for a commonality between these two groups of objects merits further investigation for what it may reveal about the continuity of materials used for artistic production in Peru across centuries.

Edgar, Heather [80] see O'Donnell, Lexi

Edington, Stacy, Jessica Cerezo-Román (University of Oklahoma), Glenys McGowan (University of Queens), Brett Kaufman (University of Illinois, Urbana) and Hans Barnard (Cotsen Institute of Archaeology)
[240]

Beyond Sacrifice: The Life Course of a Child from the Neo Punic Site Zita in Tunisia

Tophets are Phoenician and Punic cemeteries where infants and young children were possibly sacrificed, then cremated, placed in urns, and ritually interred. However, the Zita tophet, near Zarzis, Tunisia, dating from ~100 BCE to 50/100 CE presents a more complex picture allowing us to reconstruct a number of aspects of the life and death of the individuals. This study looks at the life course of one of the individuals from the site to attempt to reconstruct some aspects of the individual's life as well as how the individual was treated after death by the community. The data used for this study include a reconstruction of the biological profile, thermal alterations, and posthumous treatment of the body. These data suggest that the individual had chronic health problems and significant investment and care by the community was placed in the funeral and burial. These insights will allow us to move beyond questions of the presence or absence of infanticide and ultimately will result in a better understanding of these necropoleis.

Edwards, Briece (Confederated Tribes of Grand Ronde)

[116]

Discussant

Edwards, Nicolette (Southern Methodist University) and Mark McCoy (Southern Methodist University)

[77]

The Influence of Taphonomy on Gaps in Radiocarbon Dates: A User-Friendly GIS Model

Spatial gaps in the distribution of archaeological sites are often attributed to taphonomy. However, archaeologists rarely attempt to test or quantify how variables such as rainfall may, or may not, be influencing preservation. This study focuses on providing a simple way to assess the source of potential gaps within region radiocarbon data to avoid systemic errors in interpretations. Dated sites across Holocene Southern Africa are classified by modern annual rainfall; a proxy for conditions potentially influencing the survival of archaeological deposits. The procedure uses GIS software and Microsoft Excel as a straightforward, and open-sourced, approach. While the results require full consideration of the location and context of the archaeological sites and/or region for appropriate evaluation, contra what one would expect, our assessment suggests that there is no significant influence of rainfall on survivability. This suggests that the spatial gaps in radiocarbon dating are due to another factor, or factors, such as population density and/or biases in field survey. To check the quality of a radiocarbon dataset and avoid inaccurate interpretations more fully will require re-examination based on alternative and multiple variables.

Edwards, Nicolette [22] see Lupo, Karen

Edwards, Richard (University of Wisconsin, Milwaukee) and Robert Jeske (University of Wisconsin, Milwaukee)

[264]

Motives, Migrations, and Middle Mississippians: Fort Ancient and Aztalan Case Studies

Material culture and bioarchaeological evidence indicates that people moved from the American Bottom into the Mississippi and Crawfish River valleys of southern Wisconsin and the Ohio River Valley of Indiana and Ohio between AD 1050 and 1200. These migrations, however, should not be seen as a unitary phenomenon. It appears that the American Bottom emigration to each destination had different motives, timing, and demographics. This paper focuses on the settlement of Aztalan in southern Wisconsin and multiple Fort Ancient settlements in the Ohio River Valley. Stable carbon isotope data indicate that, as a whole, the migrants who are buried at Aztalan had a different socio-economic status than individuals who were buried in Ohio River Valley. While both populations contain significant variation, we argue that Aztalan was settled by higher status families than the families that settled the Ohio Valley. Migration to the different regions was likely motivated by different intragroup social and political dynamics following the coalescence of population in the American Bottom circa AD 1000–1050. Understanding the range of motivations for departing the American Bottom has significant implications for how these groups interacted with local Late Woodland populations and the nature of culture change that ensued within these two different regions.

[264]

Chair

Edwards, Richard [264] see Jeske, Robert

Eeckhout, Peter**[200]***Inca Impact on the Site of Pachacamac: A Critical Reassessment of the Archaeological Evidence*

The way in which the Inca Empire secured control of conquered areas shows great variations. Therefore highlighting the degree of control, that is, the level of integration of regions and sites, has become one of the main objectives of most researchers working in the imperial provinces. The famous site of Pachacamac, on the central coast of Peru, is no exception. If everyone agrees that it was a major settlement within the Tahuantinsuyu, and that the changes brought by the Incas were important, there is currently no consensus on the nature of these transformations, neither on the chronology of the monuments that evidence it. Examining the various models that have been proposed since the end of the last century, it results that if all are based on archaeology, interpretations vary greatly.

Eerkens, Jelmer [83] see Goring, Daniel

Effingham, Joseph (Idaho State University) and Samantha Blatt (Idaho State University)**[240]***Dental Morphology of the Prehistoric Chamorro, Guam*

Dental morphology has a long history of use in understanding the biological distance and migrations of past populations. Though distribution of the frequencies of morphological traits of teeth have been documented around the world, variation within Micronesia is the least studied among the peoples of the Pacific, leaving peopling of the region the least understood. This project records dental morphological traits from a collection of dental casts of pre-Spanish Chamorro remains from Guam in order to document the peopling of Micronesia through their affinity to other known groups. A collection of 57 casts were scored for 21 non-metric traits of dental crowns using rASUDAS protocols and software. Frequencies of traits were compared to other C.G. Turner II datasets and diversity of traits within this sample were compiled. Higher frequencies of Carabelli's cusp, protostylids, deflecting wrinkles, and cusp 7 were observed than expected. However, Chamorro affinity is consistent with Sundadonty of East Malay Archipelago and Ainu, but their relationship to Philippine or Taiwan samples remains debatable. As knowledge of the dental morphology of living and prehistoric Micronesians increases, the population history of the Pacific and its role in understanding worldwide patterns of migration will be clarified.

Egan, Rachel (Front Range Community College, CU-Boulder)**[157]***Prehispanic Social Networks: The Case for Innovation and Adaption as Responses to Repeat, Catastrophic Eruptions in the Tilarán-Arenal Region of Costa Rica*

Scholars have long noted the plethora of ways past societies have responded to volcanic eruptions. However, too often the story has been one of collapse and/or failure. Incorporating long time-scales has proved necessary for shifting focus to the innovative and adaptive ways cultural groups have been able to not only withstand but often also thrive, in these catastrophic environments. This paper will explore how modern technology can help us parse adaptations to the periodic volcanic eruptions which plagued the Tilarán-Arenal region of Costa Rica. Through GIS and volcanic modeling, it is possible to predict, for past eruptions, the size and extent of disturbance and the length of ecological recovery. Using these data, we can then begin to assess the relationship between cultural patterns and the adoption of new behaviors, including the novelty of separating villages from cemeteries and other important places. This occurs along with the simultaneous connection of multiple exogamous villages to each other through processional footpaths which appeared starting around 500 BC. Perhaps most importantly, this paper will address what these cultural traditions mean in the context of volcanic eruptions and if understanding them can be helpful for constructing resilience within contemporary populations in the region.

Égüez, Natalia (AMBI Lab University of La Laguna [Spain]), Jean-Luc Houle (Western Kentucky University), Oula Seitsonen (University of Oulu) and Jamsranjav Bayarsaikhan (National Museum of Mongolia)**[62]***Herbivore Dung Biomarkers: A Reference Collection for the Archaeology of Pastoral Domestic Spaces in Western and Central Mongolia*

Lipid biomarkers such as alkanes, fatty acids and sterols together with their stable carbon and hydrogen isotope ratios are nowadays leading proxies for the identification of past climate variability, human activities and animal presence in a site. These can be extracted from modern faeces, desiccated dung and soil sediments. When applied to geoarchaeological contexts, these indicators reveal significant insights on past animal diet, land use and paleoenvironment. This paper presents lipid analyses of dung pellets from five livestock species (i.e., goat, sheep, cattle, yak and horse) retrieved from modern contexts, as means for reference collection for the better characterization of archaeological pastoral domestic deposits. Dung molecular fingerprints are compared to sediments and well-preserved excrement pellets recovered from archaeological winter campsites located in Uvs and Arkhangai provinces. Results show that husbandry management and local steppe palaeoenvironments can be tracked down through detailed herbivore faecal characterization. We argue that mass spectrometry methods when applied to pastoral households help unveil complexities of pastoral production systems in Mongolia and Central Asia. The research is part of the Western Mongolia Archaeology Project (WKU and National Museum of Mongolia) with analyses carried out at the Archaeological Micromorphology and Biomarkers Laboratory, University of La Laguna.

Égüez, Natalia [62] see Houle, Jean-Luc

Eichner, Katrina (University of Idaho)**[91]***Moderator***[91]***Discussant*

Eichner, Katrina [165] see Eldredge, Kaitlyn

Eiselt, Sunday [17] see Etter, Bonnie

Eisenhofer, Raphael [100] see Weyrich, Laura

Ek, Jerald (Western Washington University)**[133]***Imported Imperialism: The Impact, Aftermath, and Lasting Political Legacy of Teotihuacan in the Maya Lowlands*

The nature of Teotihuacan influence in the Maya Area has been a topic of enduring controversy. An increasingly large corpus of evidence indicates direct military intervention at multiple cities in the Maya Lowlands starting in 378 CE. In the ensuing generations, the Teotihuacan-affiliated Mutal Dynasty of Tikal exerted control over a network of vassals. Western Mesoamerican influence was not limited to material culture but included new forms of political interaction and expansionist foreign policy. However, there has been far less emphasis on the geopolitical impacts of the collapse of this western empire in the Maya Area. The decline of Teotihuacan as a major power fomented hegemonic war, instigating lasting changes in the political landscape. The Kaanul state, a dynasty with indigenous roots, would extend control over much of the Maya Area in the aftermath. Yet, this new geopolitical order was built on enduring political structures which would be reproduced, modified, and perpetuated by kingdoms up to five centuries after the end of direct Teotihuacan influence. The central thesis of this paper is that general historical trends in the Maya Area reflected in local dynastic histories were embedded within broader pan-Mesoamerican geopolitical dynamics, including the rise and fall of Teotihuacan.

Ekdahl, Amanda, Corina Kellner (Northern Arizona University), Kerry Thompson (Northern Arizona University), Ora Marek-Martinez (Northern Arizona University) and Leah Mundell (Northern Arizona University)**[184]***NAGPRA's Final Rule in Practice in U.S. Southwest Universities*

Universities that house NAGPRA eligible collections have unique challenges and opportunities when repatriating human remains, however, there is a lacuna in the academic literature surrounding these issues. I explore the policies of repatriation in three universities to understand the ways in which university structure affects repatriation of Culturally Unidentifiable Human Remains (CUHR). CUHR have historically been used to exploit loopholes in NAGPRA to continue research on Native American ancestors, the 2010 Final Rule provided guidelines for repatriating those remains but there has been little examination of how this rule has been put in effect practically. Using postcolonial/indigenous theory and legal pluralism, I assess how NAGPRA and the Final Rule are understood and enacted in three universities in the U.S. Southwest, a region with a large American Indian population. Preliminary ethnographic research suggests that the complex hierarchical university structure, curation challenges, and opaque funding for NAGPRA compliance can hinder CUHR and NAGPRA policies in these institutions, which may be different than non-university museums. Studies such as this highlight how structural context in university settings affect NAGPRA and the Final Rule compliance, especially in the U.S. Southwest.

Eldredge, Kaitlyn (University of Idaho) and Katrina Eichner (University of Idaho)**[165]***Teacup Sherds and Rifle Cartridges: Defining Frontier Consumption Patterns and Daily Life as Practiced at Fort Davis, Texas*

This paper analyzes consumption patterns and the intricacies of daily life in the context of a nineteenth-century U.S. military fort. The authors discuss an assemblage recovered during a surface survey conducted on private property in Fort Davis, Texas. The sheet midden materials discussed were deposited by military personnel from the mid-1880s through the fort's official abandonment in 1891. Consideration of domestically and institutionally produced refuse offers a unique perspective into the construction of an American presence on the Western American frontier. Ceramics, glass, and various metals are used to consider how daily practice reinforced ethno-racial, gendered, and national identities among residents at the fort. Analysis of these materials contributes to our understanding of how the Western American frontier was historically defined, and how that definition is interpreted today. Of particular interest are the experiences of Black enlisted soldier, women, and Hispanic civilians, and the changing ways in which these communities related to one another and to the White, Euro-American community on a shifting frontier landscape.

Elgart, Alison (Florida Gulf Coast University) and Heather Walsh-Haney (Florida Gulf Coast University)**[188]***In Search of MIA from the Greatest Generation: Florida Gulf Coast University Partners with the Defense POW/MIA Accounting Agency (DPAA) to Bring U.S. Servicemen Home*

Florida Gulf Coast University (FGCU), a 20-year-old state school, recently formed a partnership with the Defense POW/MIA Accounting Agency (DPAA). In June 2019, FGCU participated in its first mission, which was the investigation of a WWII aircraft crash in Germany. For FGCU, this was the culmination of several initial endeavors. It was the first joint effort between the Departments of Justice Studies and Social Sciences, where undergraduate students from the Anthropology Program with archaeological experience and graduate students in forensic anthropology both participated. Our crew of 10 students, two professors, a forensics lab manager, a CRM archaeologist, a linguist, a DPAA EOD, and an Air Force medic worked together very

efficiently. Methods included traditional archaeological and forensic archaeology techniques, with an emphasis on metal detection. Our team was the first to excavate this crash site. Although we had the whole team on site for only about three weeks, we excavated 320 m² and investigated three possible bomb or impact craters within the site. We identified large amounts of small aircraft wreckage and collected possible material evidence that has the potential to correlate the site to a known loss incident.

Eller, Andrea [242] see Pott, Laura

Elliot Jones, Justin [37] see Zhao, Yu-chao

Elliott, Michelle (Université Paris 1, Panthéon-Sorbonne) and Yoanna Herrera-Santos (Université Paris1, Panthéon-Sorbonne)

[133]

Reconstructing Land-Use and Socio-environmental Change at Epiclassic Chicoloapan Using Plant Macroremain Analyses

The site of Chicoloapan Viejo represents a long-term occupation that spanned multiple cultural phases, each associated with changes in population size, settlement pattern, and socio-political organization. These changes were also accompanied by climatic fluctuations of varying intensity. This socio-environmental evolution through time would have thus necessitated adaptability in subsistence and resource management strategies, which in turn would have produced significant impacts on the landscape in and around the site. In this paper, we present the results of paleoethnobotanical analyses of seed and charcoal remains from several Epiclassic excavation contexts at Chicoloapan. These include potential agricultural zones and various domestic areas associated with both elite and commoner households. Through comparisons among these contexts, we are able to create an inventory of the wild and domesticated plant resources that were used at Epiclassic Chicoloapan and to infer the range of ecological and anthropic zones that were present at this time. We are also able to identify certain practices of plant collection and cultivation, as well as to explore how these activities may have differed throughout the site and according to households' socio-economic status.

[133]

Chair

Ellis, Grace (Colorado State University), Jonathan Haws (University of Louisville), Michael Benedetti (University of North Carolina Wilmington) and Lukas Friedl (University of West Bohemia)

[36]

Middle Paleolithic Human Occupation in Level JJ at Lapa do Picareiro, Portugal

We analyze artifact distribution in Level JJ at Lapa do Picareiro, a Middle Paleolithic cave site located in the Serras de Aire mountain range in central Portugal, in order to gain insight into human occupation and site formation dynamics. Documenting and observing cultural horizons in cave environments can be extremely difficult due to complex sedimentary processes. However, analysis of high-resolution spatial data allows researchers to identify lenses of human occupation and reconstruct human occupational patterns in environments where complex formation processes exist. Level JJ represents a thick, homogeneous stratigraphic level that dates to around 40–47 kya. High resolution spatial data on Level JJ has been collected since 2014 when extensive excavation of this level began. Preliminary analysis of intra-level spatial patterning of artifacts from Level JJ has revealed multiple cultural horizons within the same stratigraphic unit, suggesting human occupation was sporadic and short-lived during this time period. This research contributes toward an understanding of human occupation and site formation processes at Lapa do Picareiro and more broadly, to human use of caves in the Middle Paleolithic.

Ellis, Grace [36] see Carvalho, Milena

Ellis, Olivia (University of Arizona), John Walden (University of Pittsburgh), Ian Roa (University of Pittsburgh), Michael Biggie (Los Angeles Maritime Institute) and Rafael Guerra (University of New Mexico)

[178]

Understanding Diachronic Patterns of Feasting Related to the Development of Political Complexity at the Late Classic Maya Polity of Lower Dover, Belize

Feasting is considered to have played an important role in socio-political relations in Classic Maya society. Both elites and commoners took part in these public events to varying extents, and for different reasons. Feasts are described as promoting social cohesion, and perpetuating social inequalities through displays of wealth and status. For these reasons, understanding patterns of feasting within a polity and on different hierarchical levels of society can provide a better understanding of Classic Maya socio-political dynamics. This poster addresses the extent to which the emergence of the Late Classic (AD 600–900) Maya polity of Lower Dover, Belize impacted patterns of feasting across the immediate settlement. Analysis of faunal and ceramic assemblages from commoner and intermediate elite contexts from three neighborhoods assess how social actors at multiple scales of the political hierarchy staged feasts and how this changed following the rise of the Lower Dover polity. The poster then draws on ethnographically documented examples to explain the changing patterns evident in assemblages associated with feasting.

Ellyson, Laura (Washington State University) and Stefani Crabtree (Santa Fe Institute & Utah State University)

[165]

Network Analysis of Hopi Sheepherding Groups from Early Twentieth-Century Orayvi

The Third Mesa Hopi village of Orayvi is possibly the oldest continuously occupied village in the United States, having been founded as early as the twelfth century. Ethnographers have described Orayvi as the most conservative Hopi town because it rejected all attempts at directed culture change from the Spanish beginning around 1630 until the fissioning event in September 1906. In part

because of this split, Orayvi has been the subject of intensive study with both social and economic factors described as causes for this split. A recent study suggests that inequality, based upon ginis derived from the distribution of house sizes, at Orayvi was typical of pastoral societies. In this research, we examine this further in the context of Hopi sheep herding groups. Using data from the 1901 United States Census of Orayvi, we use network analysis to explore herding groups in relation to other factors including social stability based on whether or not a family remained or returned to Orayvi following the 1906 split.

Elquist, Ora (Public Archaeology Laboratory) and Holly Herbster (Public Archaeology Laboratory)

[63]

A Seasonally Occupied Village at Vineyard Haven, Martha's Vineyard, Massachusetts: Archaeological Investigations at the Lagoon Pond Bluff Site (19-DK-274)

Archaeological investigations conducted in collaboration with the Wampanoag Tribe of Gay Head (Aquinnah) have documented 5,000 years of Native American occupation at the Lagoon Pond Bluff Site on Martha's Vineyard, ranging from the Late Archaic period into the early Contact period. Nearly 250 features were documented that included living surfaces, evidence of structures, shell middens, roasting platforms, hearths, refuse pits, storage pits, and other pits. A combination of diagnostic artifacts, feature types, and radiocarbon dates suggest more intensive, longer-duration occupations during the Middle Woodland through early Contact periods. The distribution of the features indicates at least two main settlements or activity areas. Faunal materials suggest these later occupations occurred during the warm season (spring/summer) occupations, whereas other sites in the area are typically associated with fall, winter, and/or spring occupations.

Emery, Kitty (FL Museum of Natural History, UF), Antonia Foias (Williams College), Lisa Duffy (Florida Museum of Nature, University of Florida), Sophie Reilly (Northwestern University) and Elizabeth Webb (University of Western Ontario)

[54]

Chocolate, Manioc, and Maize: Kante't'u'ul and Chachaklu'um in Motul de San José's Realm

Between 2013 and 2015, the Periphery of Motul de San José Archaeological Project conducted fieldwork at two subsidiary sites, Kante't'u'ul and Chachaklu'um, located within 5 km of Motul de San José, the primary Late Classic center in this zone along the northern shore of Lake Peten Itza. Paleoethnobotanical and chemical residue analyses have highlighted the variety of resources exploited by the residents of these sites, from cacao orchards to corn infield gardens to root crop cultivation. These resources may have moved between sites, and especially from the subsidiary sites to Motul via two means (minimally): market exchange or tribute payments. The spatial distribution of these resources at the three sites provides hints to the economic integration of the polity, whether through either or both means of movement of goods. In his most recent work, *Against the Grain*, Scott (2017) argues that rising political elites relied on seed grains like maize to expand their taxation but discouraged root crops because the latter were not easily found and counted, nor light for transport or easily storable. The implications of Scott's ideas for the evidence from Motul and its periphery will be explored.

Emery, Kitty [129] see Fladeboe, Randee

Emery, Kitty [178] see Thornton, Erin

Engan, Emily [186] see Galvan, Dagmar

Engan, Emily [142] see Stewart, Caitlin

Englehardt, Joshua (El Colegio de Michoacán) and Michael Carrasco (Florida State University)

[191]

The Tenaxpi Egg: Ecology, Representation, and Conceptual Convergence in Olmec Art

Through the lens of "conceptual convergence," we examine the multiple symbolic strands that inform specific Gulf Coast sculptural images, focusing especially on the Tenaxpi Egg/Homshuk sculpture. This sculpture, excavated on Tenaxpi Island in Lake Catemaco, shows a figure sculpted on an egg-shaped stone. This image likely references several stories from the region in which an old couple find an egg from which a boy emerges. Among the Zoque Popoluca of the Tuxtla Mountains of southern Veracruz, the boy is named Sintiopiltsin, "god-ear-of-corn." This deity is the source and therefore precursor to actual maize, while at the same time being maize himself. After introducing this object, we examine the complex references that this image possibly presents. Specifically, we suggest that while maize is an important symbolic element, other metaphors drawn from diverse ecological systems played an equally significant role in this specific case, and in other Gulf Coast imagery. Through this example, we consider the fluidity of conflated or shared attributes within indigenous thought, in which myth, history, ideology, agriculture, and the environment are interwoven. We critically engage this framework by exploring theoretical and methodological issues associated with emic and etic conceptualizations of Formative Period artistic programs.

Enright Parsick, Erin (Applied EarthWorks Inc.)

[204]

Evaluating Qasil: Using Alternative Data Sources for Determining National Register Eligibility of CA-SBA-87.

In support of California Department of Transportation Refugio Bridges Replacement Project, Applied EarthWorks, Inc. (Æ) was tasked to evaluate CA-SBA-87 for National Register of Historic Places (NRHP) eligibility. CA-SBA-87 is at Refugio Beach along the Santa Barbara Channel coastline, contains evidence of multiple periods of prehistoric occupation, and is the named ethnohistoric Chumash village of Qasil. Due to previous disturbances of the site during highway construction, fieldwork to collect data for formal NRHP evaluation was not feasible. Therefore, Æ used alternative sources of data including ethnographic data, information from excavations completed in 1969 by G. James West, and the associated curated artifact collection to assess the significance and integrity of CA-SBA-87. Using these alternative data sources, Æ and Caltrans were able to argue for CA-SBA-87's eligibility under NRHP Criteria A and D.

Ensley, Ross (Mirador Basin Project/FARES), Richard Hansen (University of Utah), Carlos Morales-Aguilar (Université Paris 1 Panthéon-Sorbonne) and Josie Thompson (Mirador Basin Project/FARES)
[163]

Landscapes of the Mirador-Calakmul Karst Basin

The Petén Karst Plateau, bounded by normal faults on the southeast and northwest sides, was created during a Tertiary extensional event that also created the Rio Hondo Fault Zone to the East. The plateau, and its surrounding lowlands, can be subdivided into six terrains, each dominated by a particular form of karst. These include fluviokarst, intermittent lakes, cockpits, residual hills, baselevel poljes, and structural poljes. Within this framework, the Mirador-Calakmul Karst Drainage Basin lies in the southern portion of the plateau, straddling the Mexico/Guatemala border. Following the U.S. Geological Survey, a karst drainage basin is a mapping unit defined by the total area of surface and subsurface drainage that contributes water to a conduit network and its outlet springs. Comprised of the Mirador and Calakmul watersheds, the basin is bounded on the east by an anticline, on the north by a drainage divide with the Desempeño watershed, and on the west by a low ridge marked by a series of springs and steephead valleys. The landscape of the basin is dominated by fluviokarst bajos but also exhibits other karst forms including dolines, giant kamenitza, giant runnels, solution corridors, and cavales.

Enzmann, Jonas [238] see Segschneider, Martin

Eppich, Keith (Tyler Junior College TJC, The College of East Texas)
[93]

Discussant

Eppich, Keith (Tyler Junior College TJC, The College of East Texas)
[211]

Archaeological Context and Contemporary Acoustics of Ceramic Drums Recovered from Late Classic El Perú-Waka', Guatemala
 Ceramic drums appear in Classic Maya art, being carried in the hand or nestled between the legs of Native American musicians. However, they have received scant, if quite detailed, attention in the scholarly literature. This presentation seeks to expand our knowledge of these ancient musical instruments using a number of complete and partial drums recovered from the ruined city of El Perú-Waka'. Located in the northwest of Guatemala, El Perú-Waka' existed for the 13 centuries of Classic Maya civilizations with an exceptional and vibrant potting tradition. One of the products of this potting tradition was cylindric ceramic drums. Archaeologically, such vessels seem associated with large offerings or feasting contexts, sharing context with ocarinas and polychrome serving ware. This presentation examines the form, construction, and surface treatment of such vessels together with their contextual association. Furthermore, it examines the potential sounds that ancient musicians would have produced on such vessels. (Ceramic drums produce different notes than wooden ones.) Lastly, the paper places the drums in their cultural context within the past, attempting a partial explanation for their form, function, usage, archaeological context, and acoustics.

Eren, Metin [232] see Mraz, Veronica

Ergun, Müge [83] see Ugras, Funda

Erickson, Clark (University of Pennsylvania) and Jedidiah Dale (University of Texas)
[4]

Precolumbian Management of Water and Aquatic Resources in the Wetlands of the Bolivian Amazon

The domestication of landscape by Amazonian peoples is well documented. Historical ecologists highlight the creation, management, and enhancement of resources over millennia: higher than natural biodiversity, increased abundance of economic species of plants and animals, Amazonian Dark Earth, and other anthropogenic improvements. In addition to a range of crops grown in raised fields, gardens, and agroforestry, the large communities in the Baures region of the Bolivian Amazon relied on fish and other aquatic resources. A complex network of earthen causeways, canals, fish weirs, and fish ponds was built in the seasonally inundated savanna and wetlands covering hundreds of square kilometers. Causeways and canals were probably constructed for communication and movement to access settlements and resources on forest islands. This canoe culture realized that causeways could also transform annual flood dynamics within the vast wetland margin. Using GIS, error corrected DEMs, hydraulic modeling and simulation, we show that massive volumes of flood water were controlled, managed, and exploited by earthworks with substantial capture and abundance of useful aquatic resources and extended canoe use. In the Bolivian Amazon, indigenous knowledge of flood regimes and development of large-scale landscape engineering contributed to a thriving, successful, and possibly sustainable lifeway in late prehistory.

Ermish, Brendan, Shannon Boomgarden (University of Utah), Duncan Metcalfe (University of Utah) and Jordin Muller (University of Utah)
[245]

Maize Root Depth and Implications for Irrigation

Prehistoric maize farming has been well-documented in Range Creek Canyon, Utah. Evidence includes numerous corn cobs, maize storage structures, starch on ground stone tools, and pollen and isotopic evidence from sediment cores. Maize farming experiments in Range Creek suggest dry farming would not have been a sustainable option for the Fremont. With access to a permanent water source, irrigation farming would have been the most effective method of delivering controlled amounts of water to their crops, and thus allow for improved yields. Ongoing experiments in Range Creek seek to understand the efficiency in timing and amount of

water necessary to produce the highest yields despite the costs associated with irrigation. Pivotal to understanding this trade-off is documenting root depth of dry adapted maize varieties under varying irrigation regimes. With limited water, should the Fremont water deeply less often or shallow more often? To document variability in root growth, an experiment was conducted to document the roots of Pima 60-Day Maize. By watering three separate bins at different depths, we are able to measure phenotypic response in root length as a function of the depth at which the water is provided.

Ermish, Brendan [245] see Boomgarden, Shannon
 Ermish, Brendan [245] see Muller, Jordin
 Esarey, Duane [211] see Bardolph, Dana

Eschbach, Krista (Arizona State University) and John Worth (University of West Florida)

[192]

Ceramics, Categorical Identification, and the Changing Social Structure of the Spanish American Colonies

Archaeologists frequently have used distinct decorative styles, often found on serving vessels, as indicators of social identity and status. For the Spanish American colonies, focus has been placed on tableware, particularly majolica, as a measure of economic status and socio-racial identity, linked to Spanish-European commensality. Growing research throughout Latin America has demonstrated wide variability in the distribution of majolica tableware that challenges simplistic interpretations. Geographic location, settlement function, and transformations in the colonial social structure all contributed to diverse patterns in ceramic distribution. In this paper, we examine diachronic variation across three centuries and two geographic locations within the Spanish American empire: Port of Veracruz and Northwest Florida. Historians have documented at least three large-scale shifts in the organization of colonial society, from the *géneros de gente* (types of people)—based on categorical distinctions borrowed from Iberia—to the more well-studied *casta* system and, finally, to incipient economic classes. Through an examination of assemblages from Florida and Veracruz, we critically evaluate the changing role of majolica as a symbol of categorical distinction in colonial Mesoamerica and the borderlands.

[192]

Chair

Eschenbrenner, James

[52]

Recording Trash: Validating the Analysis of Trash Dumps and Stopping Them in the Future

The Orchard Combat Training Center (OCTC) is an Idaho Army National Guard (IDARNG) tank and helicopter training area which encompasses a total of 143,000 acres across southern Idaho, just south of Boise. The OCTC is owned by the Bureau of Land Management (BLM) but is managed by the IDARNG. Under a Memorandum of Agreement (MOA) between the BLM and the IDARNG, the public is allowed free-roaming access to the land in exchange for guard training. As archaeologists, we are given the task of recording the public's material remains in the desert. The most common type of artifacts are cans in the form of can dumps. The value of analyzing the historic trash dumps is that it relates to our culture, human behavior, history, and the environment. Presently, yearly training area cleanups can clean up the contemporary trash. Future dumping can be prevented by providing signs, public outreach, and educating the public to clean up after they have used the land.

[52]

Chair

Esdale, Julie (Colorado State University, CEMML) and Kelly Graf (Texas A&M University)

[81]

Spatial Arrangement of the Northern Archaic Component at the McDonald Creek Site, Central Alaska

McDonald Creek is a multicomponent campsite located in the central Tanana Valley south of Fairbanks, Alaska. In addition to late Pleistocene components, archaeological excavations at the site have uncovered a productive Northern Archaic occupation dating to the middle Holocene. A technological analysis of the lithic assemblage has delineated specific tool production areas across the site. Late stage bifacial tools of different raw materials were resharpened in discrete areas. Notably, microblade core reduction debris of the same materials were also found in the individual debitage clusters. This indicates that multiple technologies were concurrent at the scale of single behavioral events. Site activities were repetitive and represent only a small range of behavior over a short visit. The middle Holocene component at the site is very different than earlier occupations which exhibit longer term habitation and subsistence activities.

[81]

Chair

Esdale, Julie [81] see Graf, Kelly
 Esdale, Julie [81] see Henry, Aureade
 Esdale, Julie [52] see Skinner, Dougless

Eshleman, Sara (University of Texas, Austin) and Timothy Beach (University of Texas, Austin)

[206]

Remote Sensing of the Maya Environment in Northwestern Belize

Lidar and other remote sensing technologies have advanced archaeology and multiple other fields, including ecology. For archaeology, we often remove the forest from lidar images in order to examine anthropogenic construction. In this paper, we put the forest back and demonstrate how the northwestern Belize lidar consortium is using interdisciplinary studies toward understanding the environmental settings associated with Maya history. These environments provide resources for past and present populations

and have experienced many human impacts through time. Here, we assess the spatial distribution of forest attributes and their relationship to environmental characteristics in northwestern Belize. Our analyses indicate that elevation, local relief, topographic position, and aspect explain the majority of the variance in canopy height. At the same time, the canopy-topography relationship varies with spatial resolution and exhibits spatial non-stationarity, but with distinct trends within geographic areas. These initial studies lend to future work that integrates past and present human presence and activities and aids the understanding of long-lasting human-environment interactions.

Esker, Donald (Marietta College), Ren Zhang (Baylor University) and Steven Forman (Baylor University)

[19]

Carbon and Oxygen Isotope Chemistry of Hall's Cave Lagomorphs

Hall's Cave is a limestone solution cavern in Kerr County, Texas. It has been the subject of Late Pleistocene paleontological research since 1968. The cave is unique because it contains a record of near-constant sedimentation for the last ca. 17 ka. This sedimentary record spans the Younger Dryas climate anomaly and end-of-Pleistocene megafaunal extinction from ca. 12.9 ka to 11.7 ka. Fossils from large mammals have been described from the cave, but no such taxa are found in great abundance. In contrast, the cave has produced abundant rodent and lagomorph remains from near the deepest point currently excavated to a near modern *Capra aegagrus* dung layer. Thirty-one teeth from *Lepus* cf. *L. californicus* and *Sylvilagus* sp. were collected for carbon and oxygen isotopic analysis. Both isotopic systems showed a small change of -0.57‰ $\delta^{13}\text{C}$ and of -0.59‰ $\delta^{18}\text{O}$ across the extinction period, despite well-documented environmental changes during the same time elsewhere in North America. One possibility is that selective feeding by the lagomorphs may have dampened the $\delta^{13}\text{C}$ signal and that a ground-water moisture-source dampened the $\delta^{18}\text{O}$ signal. Alternatively, the region may have experienced relatively minor climate changes across the Pleistocene-Holocene boundary relative to other regions in North America.

Esparza Olguín, Octavio [130] see Tsukamoto, Kenichiro

Espenshade, Christopher

[252]

When Abandonment Is Not What It Seems: Bateys and a Mythical Landscape in Puerto Rico

When considering the abandonment behavior observed at many bateys and ceremonial sites in Puerto Rico, two common traits are noteworthy. First, the bateys are left intact, with rock art of high cultural value left in place. Second, the bateys show evidence of visitation in periods postdating their construction. Building on data from south-central Puerto Rico, the concept of an additive mythic landscape is considered. Important to this discussion is the rejection of the site perspective and the embrace of the landscape view. It is suggested that certain landscapes in Puerto Rico were slowly developed through time as locations for pilgrimages and celebrations of greater than cacique-level importance. Through time, way stations were added to the pilgrimage route. Rather than one batey replacing another, the landscape was elaborated, with the earlier bateys and rock art locations still playing an important role in the interaction of society and the mythic landscape.

Espino Huaman, Richard (Universidad Nacional San Luis Gonzaga de Ica), Jo Osborn (University of Michigan), Camille Weinberg (University of Texas, Austin) and Brittany Hundman (DirectAMS)

[21]

Caminos entre los valles de Chincha y Cañete: Un acercamiento hacia las conexiones de nuestros antepasados prehispánicos en el Perú

En los últimos años, investigaciones arqueológicas en los valles de Cañete y Chincha han avanzado nuestro conocimiento de estas regiones, sus sociedades, y sus transformaciones durante el Intermedio Tardío y el Horizonte Tardío. Sin embargo, aunque queda claro que había conexiones fuertes entre las culturas Huaco y Chincha, falta definir cómo eran las conexiones entre ambas culturas. En esta ponencia, exploramos sus conexiones y las evidencias dejadas a través del tiempo la cual surgen varias interrogantes. ¿Cómo se movía la gente entre los valles de Cañete y Chincha? y ¿cuál era la ruta que seguían? De acuerdo a nuestros datos trataremos de dar respuestas a nuestras interrogantes y generar un mejor conocimiento de las conexiones viales entre estas regiones, lo cual nos permitirá avanzar nuestros estudios sobre las conexiones sociales, económicos y políticos de los Huaco y Chincha.

Espino Huaman, Richard [21] see Osborn, Jo
Espino Huaman, Richard [125] see Weinberg, Camille

Espinosa, Silvana [67] see Belardi, Juan

Estabrook, Richard

[44]

Moderator

Esteban, Irene [11] see Fisher, Erich

Estes, Aaron (Cardno)**[167]***Beyond Bethel: Applications and Adaptations of SfM Photogrammetric Methods in CRM*

In the summer of 2018, the Bethel Cemetery in Indianapolis, IN was excavated by a team of CRM and university archaeologists. An experimental aspect of the project was to test a methodology for using structure from motion (SfM) photogrammetry to map and document each burial during excavation, instead of using traditional methods. After proving to be a successful method for documenting the excavation at Bethel, the method was used on other contracted CRM work. Cardno, the firm in charge of the Bethel excavation, has had the opportunity to utilize this photogrammetry methodology to document two other cemeteries: the Fort Brooke Estuary Cemetery in Tampa, FL and the Calvert Family Cemetery in Evansville, IN. While each application used essentially the same formula for photographing and modeling various features, each has had its own unique environmental and technical challenges. Each new set of challenges became opportunities to adapt and modify the original Bethel SfM methodology to new situations and environments. Through these further infield applications Cardno archaeologists have continued to expand the potential uses of SfM methods in CRM since its initial Bethel debut.

Estrada-Belli, Francisco (Tulane University) and Sandra Balanzario Granados (INAH, Mexico)**[223]***Dzibanché: The Early Capital of the Kaanul (Snake) Kingdom Seen through Lidar*

Dzibanché is an archaeological zone in southern Quintana Roo encompassing several large ceremonial complexes, Dzibanché, Tutil, Kinichna and Lamay connected by causeways. According to contemporary texts, it was the early capital of the Kaanul (Snake) kingdom with vast hegemonic influence across the Classic Maya Lowlands. Ichkabal is a large Preclassic ceremonial center located 11 km NE of Dzibanché. These sites are central to ongoing debates regarding the place of origin of the Snake dynasty and the nature of its political influence beyond southern Quintana Roo. Here we present the preliminary results of a lidar survey over Dzibanché, Ichkabal and neighboring areas. The new data reveal several new features including extensive residential and agricultural areas, several new causeways and outer ceremonial complexes. These data suggest a greater development of monumental architecture in the Dzibanché zone than previously known and a high degree of integration between urban zones (Dzibanché), rural zones and outer ceremonial centers (e.g., Ichkabal) since the Preclassic period.

[223]*Chair*

Ethier, Jonathan [62] see Piezonka, Henny

Ethridge, Gary [149] see Hovezak, Tim

Etnier, Michael [129] see Bovy, Kristine

Etnier, Michael [59] see West, Catherine F.

Etter, Bonnie (Southern Methodist University), Robert Selden Jr. (Stephen F. Austin University) and Sunday Eiselt (Southern Methodist University)**[17]***The Toyah Phase Paradox in Three Dimensions*

The Toyah Phase has been the subject of debate since J. Charles Kelly first defined it in 1947. Known widely as the Toyah Phase Paradox, research has struggled to reconcile the homogenous expression of this protohistoric to historic archaeological record in central Texas and the high levels of ethnic diversity witnessed by French and Spanish explorers at the turn of the eighteenth century. Recent studies have related geographic and temporal variation in artifact styles to "communities of practice" using standard 2D measurement techniques, with varying degrees of success. We build on this research by using a 3D geometric morphometric approach to examine 26 Perdiz projectile points, a hallmark of Toyah assemblages. These points were recovered from two contemporaneous sites located some 100 miles apart in the core area of Toyah Phase settlement. The primary goal of the study is to explore whether 3D imaging can identify localized variants of Perdiz points based on shape. This work, in turn, may be used to infer patterns of interaction between village clusters through network analyses at the regional scale. Implications for how cultural plurality in central Texas may have influenced Spanish missionization are discussed.

Evans, Amanda (Coastal Environments Inc.), Louise Tizzard (Wessex Archaeology Ltd), Megan Metcalfe (Wessex Archaeology Ltd) and Alexandra Herrera-Schneider (Coastal Environments Inc.)**[238]***White Caps and Laptops: Geophysical Results from the 2019 Survey of Submerged Precontact Landscapes in the Northwestern Gulf of Mexico*

Sea-level rise models since the last glacial maximum demonstrate that the North American landmass available for pre-contact human habitation was larger than at present. In the northwestern Gulf of Mexico, less than 1 m² of the continental shelf has been sampled and tested archaeologically. Out of 106 sediment cores acquired for archaeology, two have identified preserved landscape elements of interest; a probable rangia shell midden and a charcoal horizon. Both cores were collected in modern water depths of 17 m BSL, and both returned radiocarbon dates of approximately 8500 yrs BP. The two cores are 48 miles apart from one another, but in between the two locations, along the shoreline, are known archaeological sites dating to the same time period. Using the two locations and the modern shoreline, geophysical survey including both chirp subbottom and parametric sonar was conducted at targeted areas within a 234-square-mile polygon of interest. This paper will present the survey design, and preliminary results from

the geophysical remote-sensing survey cruise in May and June, 2019, which resulted in collection of over 650-line km of data. The authors will also present plans for vibracoring in spring of 2020.

[238]

Chair

Evans, Denise [143] see Scheinsohn, Vivian

Evans, Laura [77] see Smith, Heather

Evans, Susan Toby (Penn State University)

[150]

Pathways to Power: The Aztec Empire in 10 Maps

Five hundred years ago the Aztecs of Mexico were losing their grip on a tribute empire that covered much of the area modern Mexico. The empire had been only about 90 years in the making. The story of the growth of empire moves through the Mesoamerican landscape, Aztec power spilling out of the Basin of Mexico—south, west, east—toward the hot lands, toward the treasures coveted by the lords: feathers, jaguar skins, cotton, and chocolate. This poster shows the growth of empire in 10 maps, color-coded by time period to best display the surges of expansion over the careers of six Tenocha emperors (and two from Texcoco) who established and extended this organizational wonder of the ancient world.

Everett, Genevieve (Indiana University of Pennsylvania)

[190]

From Bloody Marys to Bifaces: How One Public Archaeology Program Has Made It All Possible

It's not every day that a single encounter while slinging Blood Marys behind a bar leads you to the State Conservation and Rescue Archaeology program (SCRAP) and your academic and professional mentor, Richard Boisvert. Dick's decades of dedication to SCRAP has afforded its army of volunteers from all over the country with the opportunity to spend weeks in the summer learning how to properly excavate and document archaeological sites. In addition, Dick makes the wealth of data from the SCRAP field school available to scholars as potential thesis and dissertation research topics. This paper outlines recent master's thesis research comparing the chipped stone artifact assemblages from excavation Block K at the Paleoindian component Potter Site (27-CO-60) located in Randolph, New Hampshire with the Jefferson VI (27-CO-74) Salvage Block in Jefferson, New Hampshire. This comparison not only examines spatial distribution of lithics within one Paleoindian site (27-CO-60), but also helps the principal investigator make inferences about the similarities and differences between two Paleoindian sites in proximity. Public archaeology programs such as SCRAP are an invaluable part of North American Archaeology, one that has a legacy that continues to positively affect students and the advancement of our collective knowledge of the past.

Everett, Mark (Texas A&M University)

[19]

Electrical Resistivity Tomography at Hall's Cave

The ERT (electrical resistivity tomography) geophysical method has been used at Hall's cave to characterize the subsurface to ~20 m depth inside and outside the cave. A preliminary interpretation is suggested in which different zones in the tomograms represent different geological environments. Inside the cave, zones of low resistivity are identified as accumulations of cave sediments. The thickness of cave sediments is ascertained from the depth extent of low-resistivity zones. Some areas of the cave interior have thick sediment accumulations whereas other areas have thinner accumulations underlain by limestone blocks detached from the roof or flowstones. Zones of very high resistivity are interpreted as void spaces. Several large voids have been found, the most significant of which extends along a line NE of the cave entrance. This finding indicates that the talus slope might be a locus of collapse of an extensive NE-SW-oriented cave system of which Hall's cave is just a part. Other void spaces appear in many places outside Hall's cave suggesting the existence of a regional network of caves. In addition, there are extensive zones of high resistivity that are interpreted as karstified or fractured limestone. There are also substantially large regions of intact limestone.

Everhart, Timothy (University of Michigan Museum of Anthropological Archaeology)

[107]

Digging Data: Refining Interpretations of Geomagnetic Surveys of Scioto Hopewell Ceremonial Landscapes

Scioto Hopewell ceremonial landscapes have been a fixture of public imagination and archaeological research for more than two centuries. This attention has recently been translated to the geophysical revolution in American Archaeology, resulting in the collection of massive geophysical datasets, especially of geomagnetic data. Interpretations based on these geomagnetic data have generally been approached only at the scale of identifying features, correcting antiquated site maps, and discovering new earthworks. Concomitantly to the widespread application of geophysical techniques, archaeologists have worked to sample the earthworks in service of documenting their construction histories and relationship to the broader Scioto Hopewell ceremonialism. This paper synthesizes the advances of both lines of inquiry into Scioto Hopewell ceremonial landscapes by employing a comparative analysis of ground truthed landscapes to enhance interpretations of geomagnetic data to recognized smaller-scale earthen architectural elements and the variability therein.

Evershed, Richard [61] see Miller, Melanie

Evoy, Angela (Trent University)**[62]***Neolithic Resource Use and Adaptation in the Eastern Gobi Desert: Functional Analysis of Axes and Adzes*

Stone axes and adzes first appeared in the eastern Gobi Desert at 8.0 cal BP and were incorporated into the technological package. At the same time, changes in local ecological conditions reflect a transition from continuous grass/shrub-steppe across the Mongolian Plateau to the development of dispersed patches of dune-field wetland oases and high-elevation forests. This study focuses on exploring the adoption and function of axes and adzes in the eastern Gobi Desert and their relationship to the development of these new forested ecologies. Using an experimental and use-wear approach, I analyze 29 axes and adzes from four sites in the eastern Gobi Desert of Mongolia and Inner Mongolia. Results indicate that axes and adzes were primarily used for woodworking but include other activities. Furthermore, the adoption and manufacture of axes and adzes represent an increasing investment in producing formal technologies as resources within these new diverse ecological patches were intensively utilized.

Ewen, Charles [3] see Grubb, Muriel

Extract, Jonathan (University of California Riverside)**[189]***Mythical Charters: Landscape, Ethnogenesis, and Chichimecs in Late Postclassic Mexican Cartography*

Late Postclassic Central Mexican foundation narratives do not depict unified states. Instead, the cartographic histories of Cuauhtinchan are pictorial texts preoccupied with the tenuous justification of sovereignty in a factional political landscape. A primary means of this justification was the appropriation of standardized myths into a polity's own chauvinistic foundation history. One such key trope, the citation of ancestry from the "savage" Chichimecs, I argue, was based not on historical kinship or lineage, but was an appeal to social boundaries and the rights of political domination. Following the work of James Scott, I propose that the northern desert or Gran Chichimeca was a zone of active resistance to stratified exploitation and that the presence of fundamentally different migratory groups mis-amalgamated as Chichimecas, helped contour the spatial ideology mapped by Cuauhtinchan. The analysis of how cartographic texts treat history can elucidate Nahua emic treatments of cyclical and mythic time, while also suggesting the social relationship between territory, identity, and the everyday practices of moving through space.

Eyeington, Ashley**[101]***Geoarchaeological Approach to Resolving the Origins of Bison Bone Beds at Bonfire Shelter, 41VV218, Val Verde County, Texas*

Bonfire Shelter is a large prehistoric rockshelter site located within the Chihuahuan Desert of west Texas. Early investigators determined the site to be the location of multiple bison jump events; however subsequent investigations have disputed this interpretation. My thesis research focuses on deposits at the southern end of the site within the talus cone, a depositional cone below the rim of the canyon. The purpose of my research is to answer the questions of whether the Paleoindian bone bed represents a bison jump event and if so, does it represent one or multiple events. Geoarchaeological methods including particle size analysis, magnetic susceptibility, and loss-on-ignition are providing a better understanding of the formation processes of the talus cone and as a result, insights into the origin and number of events represented within the Paleoindian bison bone bed. This presentation summarizes the results of my thesis research.

Eyeington, Ashley [165] see Overfield, Zachary

Fagan, Brian**[46]***Where the Cow Sleeps, or How I Learned about Life in the African Past*

Sixty years ago, I excavated a series of 1,000- to 500-year-old villages in Central Africa, generally digging alone without specialist assistance. One was a subsistence farming village far from ancient trade routes, the other, Ingombe Ilede, "the Place where the Cow sleeps," in the remote Middle Zambezi Valley, inhabited by gold and ivory traders. This is the story of how I experienced firsthand the harsh realities of subsistence farming from the local people in the Middle Zambezi Valley. It is also the story of how I learned the difficulties of reconstructing unwritten history and studying cultural diversity from archaeological sites. This was the first time I learned that my finds, however spectacular, were useless unless shared with the people whose ancestors I was studying. Public outreach then became the primary focus of my career.

Fahey, Brian, Kelsi Stroebe (School of Human Evolution and Social Change), Olivia Boss (School of Arts and Sciences, Rutgers University) and Curtis Marean (Institute of Human Origins, School of Human Evolution and Social Change)**[38]***Systematic Differences in Sieved and Point-Provenienced Fauna Ecofacts from PP5-6, South Africa*

In zooarchaeological analysis, there is a tendency to give point-provenienced ecofacts analytical priority over ecofacts found in sieved material. To test for the effects of this bias, we conducted a zooarchaeological and taphonomic analysis of faunal ecofacts ($n = 841$) found in the 10 mm sieved material from Pinnacle Point 5-6 (PP5-6). This is a Stone Age site on the modern south coast of South Africa that has a high-resolution record of human behavior and environmental change during the Middle Stone Age. All fauna encountered and seen by excavators in excavation are point-provenienced in situ, with no omission of small-sized or unidentifiable specimens. All sediment is subsequently sieved for any material missed in excavation. The 10 mm sieved specimens were compared to the point-provenienced faunal specimens from corresponding stratigraphic levels to test for systematic differences between provenienced and sieved faunal ecofacts. This analysis shows that ignoring fauna recovered from 10 mm sieve could lead to different zooarchaeological and taphonomic site interpretations.

Fairbairn, Phoebe [53] see Stanyard, Zachary

Fairley, Helen (U.S. Geological Survey)

[255]

Shaking the Pinyon Tree: Alan Sullivan's Contributions to Long-standing Debates about Ancestral Puebloan Subsistence in the Grand Canyon Region

The subsistence strategies of ancestral Pueblos who lived in Grand Canyon's rugged environment between AD 900 and 1250 have been a subject of speculation for as long as archaeologists have worked in the region. While most Grand Canyon archaeologists subscribe to a subsistence model of small-scale horticulture supplemented with seasonal hunting and foraging, Alan Sullivan has argued for an alternative model in which the procurement and processing of wild food resources—especially pinyon nuts—dominated the local Puebloan economy. Prior to Sullivan's work in the area, interpretations of Puebloan subsistence relied heavily on indirect evidence such as settlement distributions and architecture, whereas Sullivan employed more direct evidence such as food processing features and paleobotanical remains to define an alternative model. Although many researchers remain unconvinced that pinyon nuts and other wild foods were more important than horticultural products in Grand Canyon's subsistence economy, Sullivan's provocative arguments, and the supporting data he amassed during three decades of research along Grand Canyon's South Rim, have greatly invigorated discussions surrounding this topic. Perhaps most importantly, Sullivan's work set new standards for the types of evidence required to argue for or against future interpretations of ancestral Puebloan subsistence strategies in the Grand Canyon region.

Farace, Anthony

[78]

Assessing Visual Ceramic Petrography at Wickliffe Mounds, Kentucky

Ceramic petrography has long been criticized as being a method that is too subjective, creating a variety of outcomes depending on the analyst. The following project determines the provenance of Mississippian ceramics from the Wickliffe Mounds Archaeological Site in Ballard County, Kentucky using the creation of visual, petrographic fabric groups. The project assesses the validity of visual petrographic fabric groups by also implementing quantitative methods through the use of point-counting and PETROG software. The results are compared through a principal component analysis showing that similar results are found through each method. The analysis shows that Wickliffe Ceramics are produced using clays within a short distance of the village and mounds.

Farah, Kirby (University of Southern California)

[57]

Persistent Pasts: The Impacts of Collaborative Archaeological Research on Local (Hi)stories at Xaltocan, Mexico

Over the past 30 years, archaeological projects at Xaltocan have been highly collaborative, often involving local community members in a variety of innovative ways. Local collaborators have been invaluable partners in the recovery and interpretation of archaeological data, while increased community involvement with archaeological projects appears to have fueled renewed local interest in Xaltocan's Postclassic (AD 900–1521) legacy. Over the decades, residents of Xaltocan have constructed monuments, formed cultural organizations, and planned events geared toward highlighting specific narratives about Xaltocan's past. Sometimes, these narratives differ from those reflected in the archaeological record. Inspired by these observations and hungry to learn more, Proyecto Patrimonio Xaltocan (PPX) is designed to gain a better understanding of how residents of Xaltocan describe their heritage in relation to where they live and how archaeological research at Xaltocan has contributed to this process. PPX is largely an ethnographic project, which centers local retellings of the past, in the hopes of learning the diverse ways in which peoples are (or are not) blending local or family (hi)stories with archaeological knowledge. Among other things, this project highlights alternative narratives and seeks out ways to center these narratives in the context of future collaborative archaeological research.

Farahani, Alan (University of Nevada, Las Vegas)

[139]

Moderator

Farina, Adriano [25] see Mattioli, Tommaso

Farina, Angelo [25] see Mattioli, Tommaso

Farley, Ned [78] see Richards, John

Farley, William (Southern Connecticut State University)

[12]

Hearth, Home, and Colonialism: Cultural Entanglement at Calluna Hill, a 1630s Pequot War Household

This paper explores the nature of cultural change and continuity during the early colonial period (ca. 1615–1637), an understudied period in southern New England. The earliest years of intercultural exchange between Europeans and Native people in the region is believed to have brought sweeping disturbances to Native American lifeways, however the nature and pace of those changes is little understood. The site of Calluna Hill (CT 59–73) is the location of a small Pequot village burned by the English during the Pequot War in 1637. The excavation of a domestic site from these earliest years after the arrival of Dutch traders and English settlers to

Connecticut is exceptionally rare and offers us an opportunity to understand the complex and agentive ways that the Pequots adopted novel materials and ideas into their worldview. I use the theory of cultural entanglement to understand the direction and nature of cultural transformation in a period absent the asymmetrical power dynamics of the eighteenth and nineteenth centuries. I examine Pequot indigenization of materials and architecture to assess the ways that Pequots maintained long-standing practices to mitigate a fast-changing colonial environment.

Farmer, Andrea (MCX CMAC, U.S. Army Corps of Engineers) and S. Terry Childs (Department of the Interior [Retired])
[132]

Employing Innovative Solutions to the Archaeological Curation Crisis

In the 1940s, federal agencies began large-scale construction projects that produced archaeological collections with both short and long-term scientific value to the agency, curatorial institution, and the nation. These efforts, as well as the enactment of federal preservation laws in the 1960s and 70s, generated a backlog of archaeological collections that were processed to varying non-uniform standards and degrees and often not properly curated. These and many other factors contributed to the curation crisis faced in our discipline for decades now. Federal agencies, including the U.S. Army Corps of Engineers and the Department of the Interior, have developed and implemented both local and national approaches to manage these important cultural resources. This paper explores the curation crisis and presents innovative and unique solutions that have been used to address the curation crisis in the federal government, such as the consolidation of archaeological collections into federally compliant regional centers, coupling veterans in need of transferrable job skills with archaeological laboratory work, efforts to generate and preserve digitally born collections, and the creation of a standardized cataloging database that will be publicly accessible in the future for research, interpretation, heritage needs, and public programs.

[132]

Chair

Farmer, Andrea [132] see Joseph, J.

Farmer, James (Independent Scholar)

[141]

The "Lack" of "Creativity" in Precolumbian Art: The Impact of Terence Grieder's Early Scholarship on Recent Rock Art Studies

In his earliest scholarship, Terence Grieder set forth several broad-ranging concepts regarding the interpretation of ancient American art and its relationship to archeological methods of the time. Grieder was an avid proponent of the idea that in spite of deep-set historical classifications imposed on ancient American culture (i.e., "Olmec," "Maya," "Anasazi," "Moche," etc.), virtually all documented ancient American societies shared a basic set of fundamentally similar beliefs and ideologies; that all ancient American art forms extending well into the past had always been technically, intellectually, and iconographically highly sophisticated; and as a result of these two assertions, as well as his application of strict art historical analysis, the traditional notion of "creativity" in both ancient American archaeological and art historical scholarship has undergone significant reconsideration. This presentation focuses on three of his earliest publications, and the impact of his approach on recent studies of two early ancient American rock art traditions, specifically the Barrier Canyon Style centered in Utah, and the Pecos River Style in southern Texas. Long believed to be disassociated with any historic Native American peoples, and thus archeologically "extinct," recent scholarship has demonstrated strong iconographic ties to later Puebloan and central Mexican (Aztec and Huichol) beliefs.

[141]

Chair

Farquhar, Jennifer (University of Pittsburgh), Arlene Rosen (University of Texas, Austin) and Yadmaa Tserndagva (Mongolian Academy of Sciences)

[62]

Adaptive Strategies of Early Herders in Mongolia's Desert-Steppe: Implications for Understanding Social-Ecological Dynamics, the Development of Food Production, and the Study of Long-Term Social Change

Currently, archaeologists have a limited understanding of the origins of pastoral economies in the Mongolian desert steppe, due to a lack of data in this region. Our project in the Ikh Nart Nature Reserve in southeastern Mongolia is addressing this gap through a multiscale investigation of human-environment interactions, specifically the relationship between climate change and land use, and how adaptive strategies impacted natural and social environments during the transition from a foraging economy to herding (ca. 4000 BP). Our recent archaeological survey and excavations have identified several archaeological sites dating to this important economic transition. Ongoing geoarchaeological work contextualizes these finds, revealing evidence for increased aridification and decimation of wetlands during this economic shift. These data will be combined with recent landscape-level investigations to assess settlement mobility prior to, during, and after these transitions as a way to understand adaptive strategies of early herders, including differences in how, when, and why people moved, illuminating how people make decisions about changing environmental conditions. Examining the nature and timing of these strategies can help to identify factors that lead to sustainable and lasting systems, or alternatively to abrupt alterations or reorganization of social and economic systems

Farrell, Sean (Texas State University)

[101]

Refining Chronology and Site Formation Processes at Bone Bed 1, Bonfire Shelter: A Geoarchaeological Approach

Texas State University's excavations at Bonfire Shelter in Val Verde County, Texas, have yielded new data regarding site formation processes associated with Bone Bed 1, a series of potentially older than Clovis strata bearing the remains of extinct Pleistocene fauna. Excavators in the 1960s and 1980s argued that the remains were culturally modified, but no unambiguous artifacts were recovered. This paper reports the results of the renewed excavations at Bone Bed 1. Two excavation blocks and one sampling

column spanning the Bone Bed 1 strata and portions of the Late Paleoindian Bone Bed 2 were excavated. Geoarchaeological methods including loss on ignition, particle size, and magnetic susceptibility assays supplemented with X-ray diffraction, total organic carbon, and stable carbon/nitrogen isotope analyses were implemented to deconstruct the depositional environment at the end of the Pleistocene and contextualize the presence of faunal remains within these strata. New AMS radiocarbon dates associated with mammoth and horse remains provide better temporal control for Bone Bed 1. The potential implications of these data for Bone Bed 1 and the Early Paleoindian record of Southwest Texas are explored.

Faulseit, Ronald (Field Museum)

[138]

Making the Landscape Divine at Dainzú

Throughout its prehispanic occupation, Dainzú played a significant ceremonial role in the Oaxaca Valley of Mexico. In the Formative period (200 BCE–CE 200), prominent terrain features were intentionally incorporated into the settlement's design with the intent of making a shared place through ritual practice. For example, a ball court and temple complex built at the base of Cerro Dainzú were linked to a shrine on its summit, requiring people to navigate the difficult and unpredictable topography between them as part of a ritual procession. By walking this challenging landscape together, they were not only creating a sacred place, but also building community in the process. In later centuries, settlement growth led to expansion into new territory, and leaders found novel ways to construct communities tied to the landscape. In this paper, I will examine diachronic patterns in place-making practices at Dainzú and discuss their social and political implications.

Fauvelle, Mikael (Boise State University)

[203]

Obsidian Exchange and Political Change: Shifting Patterns of Obsidian Use across the Late Classic and Postclassic at Fracción Mujular

Fracción Mujular is a small domestic settlement located on the slopes of Cerro Bernal near the Pacific Coast of Chiapas, Mexico. Founded under the auspices of the Early Classic center of Los Horcones, Fracción Mujular was occupied for nearly 1,000 years, persisting through the collapse of Los Horcones at the end of the Early Classic and entering into a period of rapid expansion during the Late Classic. Over the course of its occupation, the inhabitants of Fracción Mujular used large quantities of imported obsidian, favoring obsidian from Mexico over more proximate sources in Guatemala. This paper presents the results of pXRF sourcing of 502 obsidian artifacts from Fracción Mujular. My results show a clear shift in obsidian provenience through time, with obsidian from the Pachuca source heavily favored during the Early Classic, while obsidian from the Zaragoza source dominates the assemblage in the Late Classic and early Postclassic. In this paper I present several possible explanations for this shift, and discuss potential implications for our understanding of the ancient political and economic landscape of the Pacific Coast of Chiapas.

Faux, Jennifer (Palo Verde College)

[189]

Human Representations of Structure: A Theoretical Examination of Half-Conical Figurines from Teotihuacan, Mexico

Despite their ubiquity at Teotihuacan, little is known regarding the role of Half-Conical figurines in the everyday lives of Teotihuacanos. These figurines are referred to as Half-Conicals due to their semi-conical shape. Produced primarily during the Xolalpan (350–550 CE) and Metepec (550–650 CE) periods of Teotihuacan's history, these aesthetic human representations are rarely studied. While many figurine typologies were revealed in Teotihuacan's material culture, these figurines varied from earlier traditions in their aesthetic quality—they are far more ornate and elaborately adorned than previous figurine traditions. Present in high, middle, and low-status households, these figurines were likely available to all Teotihuacanos. Given their pervasiveness and importance in the Teotihuacan figurine tradition, I seek to evaluate the sociopolitical implications of Half-Conical figurine use at Teotihuacan through a practice and agent-based approach, arguing that these figurines were one of the many engines by which Teotihuacan elite perpetuated their social power. This social power, enacted by the elite through a top-down approach, led to dramatic changes in the social structure, structure that affected all elements of public and private life, including Half-Conical use in everyday life.

Feak, Angela (University of Michigan), Brian Stewart (University of Michigan), John Kingston (University of Michigan) and Genevieve Dewar (University of Toronto)

[76]

Tracking Paleoaridity through Multi-Isotope Analyses of Ostrich Eggshells at Spitzkloof Rockshelter A, South Africa

Stable isotopes in ratite eggshells record information about the birds' diet during shell formation, making them valuable proxies for paleoenvironmental reconstruction. Here we present the results of carbon, oxygen, and nitrogen stable isotope ratios in ostrich (*Struthio camelus australis*) eggshell (OES) collected in excavation at Spitzkloof A, a rock shelter in the semi-arid desert of Namaqualand, South Africa with a late Pleistocene cultural sequence spanning ~60–17 ka. Our analysis of the organic and inorganic fractions preserved in OES fragments contributes to a complex picture of diachronic changes in local vegetation, aridity and temperature, allowing for critical consideration of which aspects of ostrich behavior and physiology—and by extension the surrounding environment—are recorded in OES. Our results augment ongoing efforts to develop a robust paleoenvironmental record for Namaqualand, allowing us to better contextualize human exploitation of this now-marginal setting during the late Pleistocene, and of arid environments by early members of our species more generally.

Fedick, Scott (University of California, Riverside) and Louis Santiago (University of California)

[178]

Evaluating the Food Values of Alternative Crops and Implications for Drought Effects on the Ancient Maya

Far from being limited to maize, beans and squash, the ethnographic Maya are known to make use of 497 species of food plants indigenous to the Maya Lowlands. This study presents initial results of determining “food values” based on nutritional content for these plant species, and the methods used to determine the values. The results have significant implications for expanding our understanding of ancient Maya foodways, and alerting paleoethnobotanists to consider the archaeological visibility of alternative crops that may have contributed to ancient subsistence. A specific goal of the study is to identify drought tolerant species of high food value that could have mitigated the effects of ancient droughts on food supply, and which may find growing importance to modern farmers under conditions of ongoing climate change.

Feinberg, Joshua (University of Minnesota)

[19]

Layered Sediments of Hall's Cave Preserve a Record of Geomagnetic Field and Environmental History for the Last ~18,000 Years

Naturally occurring magnetic minerals often become entrained within sedimentary environments and can provide an enormous amount of information about the direction and intensity of the Earth's ancient magnetic field, as well as about environmental conditions through time. The well-dated, layered sediments within Hall's Cave provide a high-resolution archive of paleomagnetic and paleoenvironmental data of great value to both geophysicists and paleoclimate researchers. Hall's Cave sediments provide a record of geomagnetic field direction and strength for the last 17,000 years cal BP. Intriguingly, at ca. 3000 years ago, the intensity data indicate an almost four-fold increase in geomagnetic field strength lasting several hundred years and contemporaneous with more short-lived, decadal-scale geomagnetic spikes reported from the Near East. Evidence for this extreme intensity event outside of the Near East has major implications for our understanding of dynamics within the planet's liquid iron outer core. Variations in the concentration, composition, and grain size distribution of magnetic minerals throughout the Hall's Cave section also capture clear centennial-scale environmental perturbations, including Heinrich event 1, the Bølling-Allerød, the Younger Dryas transition and the '8.2 ka event.' Thus, temporal changes in precipitation, temperature, and vegetation above the cave are retained by the sediment's magnetic mineral assemblage.

Fenn, Thomas (Department of Anthropology), Laure Dussubieux (Field Museum, Chicago), Shinu Abraham (St. Lawrence University) and Alok Kanungo (IIT Gandhinagar, India)

[249]

Ancient and Historic Glass Production in India: Preliminary Results of Raw Material Analyses

Glass, and particularly glass beads, was a common commodity of Indian Ocean trade, beginning as early as the mid-first millennium BCE and continuing through the second millennium CE. While existing elemental and isotopic analyses of glass beads recovered from outside India have identified glass production recipes likely from India and South Asia, little else is known about the potential production sources within these regions. An NSF-supported project designed to explore ancient glass production in India has completed a second year of fieldwork, and preliminary results of elemental and isotopic analyses aimed at characterizing glass raw materials from India are now available. The foci of research in India were sampling glass raw materials (e.g., sand, reh [alkali source], etc.) from regions of known and presumed historic and ancient glass production. To this end, dozens of potential raw material loci have been sampled in five main regions of India (Tamil Nadu/Pondicherry, Andhra Pradesh, Maharashtra, Gujarat, and Uttar Pradesh), and those materials have been or will be subjected to elemental and isotopic analyses. While not all raw material samples are clear matches with ancient glass recipes, preliminary elemental and isotopic results show connections to glasses from within and beyond India.

[249]

Chair

Fenn, Thomas [249] see Abraham, Shinu

Fenn, Thomas [234] see Miller, Ian

Fenton, Monica (Louisiana State University) and David Chicoine (Louisiana State University)

[233]

The 2019 Malacological Assemblage from Cerro San Isidro: Preliminary Insights into Ancient Foodways in the Moro Region of the Middle Nepeña Valley, Peru

Andean zooarchaeologists have extensively documented the importance of marine resources in ancient coastal Peru. Preliminary zooarchaeological results of the first excavation season at Cerro San Isidro prove no different. The multi-component hilltop site sits in the lower yungas zone of the middle Nepeña Valley, coastal Ancash, Peru, at least an eight-hour walk from the ocean. The 2019 field season focused on an elite compound and documented three superimposed occupational phases going back to at least ca. 500 BCE. This paper focuses analysis on malacological taxa. While both marine and terrestrial species were identified, four species of marine bivalves—*Donax obesulus*, *Semimytilus algosus*, *Perumytilus purpuratus*, and *Mesodesma donacium*—dominate the mollusk assemblage. I compare the relative proportions of each taxon for each phase in order to shed light on the degrees of continuity in how ancient Andean peoples supplied and processed marine shellfish throughout time. I discuss what the results imply in light of data from neighboring coastal settlements, in particular Caylán, Huambacho and Samanco in the lower and coastal section of the Nepeña Valley. The paper offers preliminary insights into ancient foodways in the previously understudied region of Moro.

Ferguson, Jeffrey (University of Missouri)

[30]

Discussant

Ferguson, Jeffrey [203] see Schaefer, Jonathan

Ferguson, Jeffrey [120] see Van Keuren, Scott

Ferguson, T. J. (University of Arizona)**[58]***Discussant*

Ferguson, Victoria [251] see Chapman, Ellen

Fernandes, Paul (Sarl Paléotime, Université Bordeaux 1), Vincent Delvigne (UMR 5199 PACEA, Service de préhistoire Université) and Jean-Paul Raynal (UMR 5199 PACEA, Max Planck for Evolutionary Anthropology)**[30]***"I've been havin' some hard travelin'. . .": Using the Evolutionary Chain Concept in a Dynamical Approach*

The originality of this approach is in applying various scales of observation to every aspect of a classical approach in order to develop the notion of evolution. A type of siliceous raw-material (genetic type) is now understood as a population composed of different sub-types which characterize the range of primary and secondary sources (sub-primary, alteritic, colluvial, alluvial...)—we say gitologic types—from which they originated before they were collected by humans and finally we classify the sub-types resulting from archaeological use, discard and taphonomic history. Our analysis methodology uses three grid-charts, grouped in a database. Each chart focuses on a particular aspect in the life of the siliceous raw-material: 1) Grid 1, "petrography," deals with siliceous raw-material genesis. 2) Grid 2, "gitology," holds information about the processes related to the pre-depositional phase (= pre-archaeological conditions). 3) Grid 3, "taphonomy," holds information related to the postdepositional phase (archaeological use and site history). This database seems to be adapted to clarify questions about siliceous raw-materials and solves some problems of definition and description encountered by archaeologists. We outline our methodology and illustrate its different aspects based on the evolutionary chain of siliceous raw-material using geological and archaeological case studies.

Fernandez, Marco [5] see MacDonald, Brandi

Fernandez, Rachel (Center for Digital Antiquity)**[95]***Discussant***Fernandez Diaz, Juan Carlos (University of Houston / NCALM) and Ramesh Shrestha (University of Houston / NCALM)****[206]***Overview of the 2016 NCALM Lidar Surveys over the Orange Walk District of Belize*

During the first week of July of 2016, the National Center for Airborne Laser Mapping (NCALM) conducted three flights with which a total of 373.2 km² of high density multispectral lidar were collected. These data were gathered over three distinct areas of interest within the Orange Walk district of Belize which include 274.6 km² along the Rio Bravo and Blue Creek, 39.8 km² northwest of Tres Leguas and 58.8 km² along the Rio Hondo between Blue Creek and San Roman. The Teledyne Optech Titan multispectral lidar sensor was used to collect the topographic and spectral data at a nominal lidar pulse density of 25 shots per m². This talk will introduce these datasets coverage, technical characteristics as well as their potential and limitations for archaeology and ecology investigations.

Fernandez Diaz, Juan Carlos [102] see Stanton, Travis

Fernandez-Gotz, Manuel (University of Edinburgh)**[48]***Oscillating Settlement Networks: Aggregation and Dispersion in Iron Age Central Europe*

Recent studies on early urbanism have highlighted the non-linear character of settlement aggregation processes, with periods of increasing nucleation generally followed by others of dispersion and a return to more decentralized patterns. Iron Age Central Europe provides a perfect case study for exploring the oscillation of settlement networks in time and space. The Early Iron Age witnessed the development of the first urban centers which, while heterogeneous in layout and functions, can be interpreted as part of a network of peer polity interaction. A multi-scalar approach allows for the identification of different levels of settlement hierarchy, which were subject to dynamic changes. This paper will introduce the main results of recent research, analyzing the oscillation of settlement networks at both a supra-regional and regional-local scale.

Fernandez-Gotz, Manuel (University of Edinburgh)**[207]***Discussant***Fernandez-Repetto, Francisco (Universidad Autónoma de Yucatán) and Lilia Fernandez-Souza (Universidad Autónoma de Yucatán)****[57]***Cultural Heritage, Storytelling, and the Intimate Museum: Digital Museum in San Antonio Sihó, Yucatán*

Based on previous archaeological research conducted in San Antonio Sihó, in 2018 numerous dialogues with junior high school teachers took place, to develop a strategy where students would start to think about cultural heritage with emphasis in their surroundings, mainly nature and sociocultural context. After a series of visits, we decided to develop a virtual digital museum that

could contribute toward developing an awareness of cultural heritage, past and present. Inspired by Orhan Pamuk's idea of small museums—as opposed to monumental museums—we propose an intimate museum or museo cercano. Using digital resources, mainly photography and video, the museum's collection is being built upon local knowledge, stories such as the history of henequen hacienda, patron saint fiestas, corn field production and personal experiences and interactions with archaeologists. Here, we would like to showcase and reflect over the entire process of transformation from these stories into the museum's collection.

Fernandez-Souza, Lilia [57] see Fernandez-Repetto, Francisco

Fernandini, Francesca (Pontificia Universidad Católica del Perú)

[21]

One Settlement, Many Communities

Research centered in the prehispanic urban settlement of Cerro de Oro, in the Peruvian South Coast, is showing a wide variety of cooking techniques, disposal arrangements and even culinary preferences which seem to reflect possible different social groupings within the settlement. This paper will present research performed in different residential spaces within Cerro de Oro, focusing on spatial arrangements and use of space, as well as contextual analysis of food related spaces. This information will be used to explore the particular social configuration that characterized the urban society of Cerro de Oro.

Fernandini, Francesca [243] see Varillas, Rosa María

Fernstrom, Katharine (Towson University)

[164]

Mapping Human Imagery in Precontact North American Social Networks

Precontact North American human figures are very diverse in style when style embraces media for example ceramic vs shell; technology for example pipe vs ornament; and appearance for example seated vs standing or full figure vs face. Stylistic areas on the landscape can be defined for elaborate ritual figures but geographic distinctions among less elaborate figures are not as clear. This paper asks two questions: 1) Did geographic boundaries for styles of prehistoric human figure production parallel boundaries of political and cosmological organization across North America and 2) can we differentiate hierarchies of human figure production and usage that correspond to organizational hierarchies of household vs upper level administration? An example of the first question encompasses the distinction between fired and unfired ceramic clay figurines, in which clay can dissolve but ceramic cannot, which may be a significant ritual difference. An example of the second question encompasses the distinction between ceramic figurines, human figural pipes, and shell or copper ornaments. Clay is a ubiquitous material accessible and used by households and leadership, while copper and shell seem to be used primarily in ritual leadership.

[164]

Chair

Ferrara, Scott (Binghamton University [SUNY])

[119]

Considering Plants as Indicators of Protohistoric Cultural Change in Mohawk Valley, NY

The Protohistoric period of the Mohawk Valley, NY is defined by the introduction of European trade goods within the archaeological record circa AD 1525. However, the paleoethnobotanical analysis of macrobotanical assemblages is devoid in discussions of Protohistoric cultural change in the archaeological record. This research examines the impact of colonialism through a paleoethnobotanical analysis of the Swart Collection, an assemblage of soils collected from Mohawk Valley archaeological sites ranging from the Early Woodland period to the seventeenth century. The findings in this study elucidate how foodways, medicinal practices, and fuel use were affected by European influences. This illustrates the degree to which human-plant use played a role in the cultural hybridization that marked a major change in lifeways and the archaeological deposition of material culture. Further, this synthesis of a statistically valuable macrobotanical dataset of the Mohawk Valley contributes to a broader understanding of Indigenous lifeways of the studied region, along with contributing to the paleoethnobotanical record of the Northeast.

Ferraro, Joseph (Baylor University), Gary Stinchcomb (Murray State University), William Lukens (University of Louisiana, Lafayette), Katie Binetti (Baylor University) and Steven Forman (Baylor University)

[8]

Late Quaternary to Holocene Human Occupation of the Chalbi Basin, Northern Kenya

Modern humans currently occupy most habitats on Earth. Despite substantial theoretical and practical interest, however, relatively little is known regarding the evolutionary history of human occupation of extreme arid environments. Questions of chronology and constraints, as well as the character of relevant hominin adaptations remain—at best—only partially-answered. Recent research in the Chalbi Basin, northern Kenya, explores human occupation of an arid, inland African basin over the last 36 ka. Modern conditions reflect an arid bushland and dune field (<200 mm rain/yr) giving way to an expansive salt pan, the remnant of a past alkaline lake. Geological analyses detail changes in past vegetative cover and lake levels, broadly cycling between desert conditions and lake-margin bushland/grasslands. Archaeological excavations at Farre (GfJo2) sample a slight promontory above the modern pan. The upper unit dates from 36 ka to 22 ka. Controlled excavations in this layer recovered 4,000+ archaeological lithic pieces, representing a range of locally-available lithologies. Small, informal quartz and chalcedony flakes dominate the assemblage. Despite evidence of increasingly arid paleoenvironmental conditions through time, the archaeological record is continuous through this excavated upper unit. A range of techno-cultural adaptations are proposed and discussed. Funded by NSF BCS-1524036, BCS-1524041

Ferras, Mélanie (Paris-Sorbonne)**[266]***Archaeological Contexts and Social Uses of Pututus in the Prehispanic Central Andes*

Pututus are marine shell trumpets (organologically, horns), known in the Prehispanic Central Andes from the Archaic period to the Late Horizon. Different classes of those sound-producing artifacts have been discovered: some of them cut from various species of marine gastropods, and others produced in ceramics that imitate the gastropod shape (skeuomorphs). Pututus can be analyzed as sound-producing instruments via acoustical and organological studies, but they also must be understood as archaeological artifacts, with a strong social focus. By analyzing them within their specific archaeological contexts, we can better comprehend their status, and also trace the evolution of related sound practices through time. Thus, it is possible to determinate different social uses of pututus, which are, most of the time, related to their acoustical possibilities. In this study, I take a complementary approach to analyzing archaeological contexts, sound-related evidence, and iconographic data to produce a comprehensive evaluation of social-sound practices involving pututus in the Prehispanic Central Andes.

Ferraz da Silva, Tiago (USP, MPI-SHH), Tábita Hünemeier (University of São Paulo), Johannes Krause (Max Planck Institute for the Science of Human History), Cosimo Posth (Max Planck Institute for the Science of Human History) and André Strauss (University of São Paulo)
[244]*Genetic Diversity of Shell Midden Builders along the Brazilian Coastline*

The expansion of South American groups along the coastline of Brazil has been studied through many different disciplines. Along the Brazilian coast the vast presence of large shell middens, the so-called Sambaqui, is remarkable. The knowledge accumulated about the Sambaqui builders societies has demonstrated an evolving process of complexification and acculturation through time. Nevertheless, many questions remain unanswered about those coastal settlements. Archaeogenomics studies provide the possibility to investigate the genetic variability of ancient groups and to trace the genetic affinities between past and present-day populations. However, few archaeogenetic studies have looked at the genetic variation of prehistorical groups from Brazil, and the demographic history of the Sambaqui builders remains largely unknown. To shed light on the genetic variation of early Brazilian coastal groups, we sampled ancient human remains dated between around 10,000BP and 950BP from 11 archaeological sites located along the Brazilian coast. We produced genomic capture data enriched for a targeted set of around 1.2 million single nucleotide polymorphisms to compare the genetic ancestry of different groups. Integrating them with the known genetic variation of other ancient South American individuals will help to increase the understanding of putative past migrations and admixtures along the coastline of Brazil.

Ferring, Reid**[170]***The Alpha and Omega of Clovis Lithic Technology: Evidence from the Gault and Aubrey Sites in Texas*

Among Mike Collin's many researches, his work on Clovis lithic technology, including the Gault assemblages, is significant for Paleoindian studies. Situated on an outcrop of high-quality Edwards Chert, Gault's Clovis artifacts register all phases of lithic reduction, including production of bifaces, blades and many retouched tools. At the Aubrey Clovis Site, almost 10,000 lithic artifacts from two camps are indicative of long-distance procurement: Tecovas quartzite and chalcedony predominate, but lesser materials include Arkansas Novaculite, Alibates Jasper and several varieties of Edwards Chert. Despite the low frequencies of bifaces and retouched tools, as well as the very different raw materials, Aubrey artifacts bear unmistakable signatures of the Clovis biface and blade technologies documented at Gault. Just as important, the Aubrey lithics clearly show the high degree of blank and tool curation associated with high mobility on the Southern Plains. The Gault and Aubrey lithic assemblages thus provide key insights into patterns of Clovis raw material procurement, processing, transport and final discard that contribute toward definition of a multifaceted Clovis Chaîne Opératoire.

Ferris, Jennifer (Cardno)**[253]***Refining Interpretations of Technological Organization Using Stone Tool Functional Analyses: Recent Investigations at the Olcott Site*

The Olcott site (45SN14), first recorded nearly 60 years ago, was fundamental in defining the Old Cordilleran Culture in western Washington. Situated on a narrow river terrace upstream from two named Stillaguamish villages, the Olcott site was heavily utilized for hunting for thousands of years. Though it is characterized as a hunting locale due to the high occurrence of stone tools, no organic materials or features have been found on site to support this functional interpretation. Recent excavations at the site provided an opportunity to conduct macro- and microscopic analyses on the newly recovered stone tools. Combined with experimental use-wear studies, these analyses better refine our understanding of tool use and technological organization at the site. This approach exemplifies methodologies advocated by William Andrefsky Jr., who contributed greatly to technological and experimental analyses in archaeology.

[253]*Chair***Fertelmes, Craig (Logan Simpson) and Colleen Strawhacker (National Snow and Ice Data Center)****[125]***You Reap What You Sow: Long-Term Consequences of Divergent Hohokam Subsistence Strategies in the Queen Creek Drainage of Arizona*

Site AZ U:14:49(ASM) is a large prehistoric Hohokam village located along an ephemeral stream within the Queen Creek drainage of south-central Arizona. Nearly a century of research at the site has revealed that the village was inhabited for at least 800 years

(ca. AD 700–1500) and, to this day, remains an important place among descendant O'odham. Recent data recovery excavations at AZ U:14:49(ASM) further revealed that the population of the village waxed and waned opposite of other sites in the Queen Creek area. To explain this variation, we employ resilience theory, which explores the interplay between human decisions and the transformation and persistence of socioecological systems. Specifically, we posit that settlement at AZ U:14:49(ASM) was beneficial during periods of drier conditions given its location at the interface of multiple ecotones and within a unique hydraulic setting. However, when wetter climate conditions prevailed, population at the site declined as households pursued more intensive farming strategies in the fertile lowlands. This paper discusses the variable risks and ultimate consequences of human actions designed to promote household economic stability.

Fertelmes, Craig [79] see Phillips, Bruce
Fertelmes, Craig [229] see Plumlee, R. Scott

Festa, Marcella (Northwest University, Xi'an)

[205]

The Social Side of Death: Mortuary Variability and Social Complexity in the Ili Region (Xinjiang)

The Ili region, in northwestern Xinjiang, is a large valley open to the Kazakhstani steppe and has been acknowledged as crucial for understanding the eastward spread of the Andronovo culture (ca. 1900–1200) in the Bronze Age (ca. 2000–1000 BCE). In over fifty prehistoric sites excavated since the last century, considerable quantities of pottery and metals have been found that are typologically and compositionally comparable to the Andronovo material from Semirech'e and northeastern Kyrgyzstan. Most research, however, has overlooked that, in sharp contrast to the cultural homogeneity of the assemblage, grave structures and burial rites vary considerably and do not consistently adhere to the Andronovo model. This phenomenon can be investigated as a context to study the local society and its evolution. The understanding of mortuary variability can also provide more solid foundations for discussing mechanisms of cultural interaction with the Andronovo culture. In this research, mortuary data are cross-examined, according to scales of analysis, and through human-environment interaction analysis. Data are subjected to statistical analyses in order to highlight patterns of continuity and discontinuity in burial practices across time and space. The social dimension of mortuary behavior is ultimately discussed, and the socio-economic evolution of the research area outlined.

Fiallos, Pedro [201] see Ortiz, Byron

Fiedel, Stuart [103] see Morrow, Juliet

Fiel, María Victoria [198] see Franco, Nora

Field, Erin [221] see Bush, Dominic

Field, Julie (Ohio State University) and Joy McCorriston (Ohio State University)

[226]

Teachable Moments: Assignments and Assessment in the Anthropocene

Over the past five years, we have redesigned our GEC level World Prehistory and Introduction to Archaeology course to engage with the prehistory of the Anthropocene. Writing our own text has allowed us to focus student attention on major concepts that are relevant to understanding the history of the Anthropocene, such as diversity, technology, extinctions, human decision making, building monuments, conspicuous consumption, and extracting the modern world. But how do we convey the lessons of our courses beyond merely reading text? Further, how does assessment provide evaluation but also feedback that carries learning forward? Here we discuss assignment generation and assessment within the framework of a course dedicated to teaching the Anthropocene. We present our goals as the instructors of these topics, and ideas for in-class and out-of-class lessons that focus on archaeology's unique perspective on the Anthropocene. We investigate how assessment and student feedback can further enhance student action and understanding of archaeology's relevance in an anthropogenic future.

[226]

Chair

Field, Julie [76] see Kirgesner, Samantha
Field, Julie [226] see McCorriston, Joy

Field, Sean (University of Notre Dame), Donna Glowacki (University of Notre Dame), Tim Hovezak (Mesa Verde National Park, NPS) and Kelsey Reese (University of Notre Dame)

[149]

The Far View Archaeological Project: An Introduction

Over the history of Mesa Verde National Park, the Far View community has been the focus of multiple, yet discrete archaeological projects, from Fewkes' excavations in the 1920s to more recent architectural documentation and stabilization in 2012. However, there are gaps in survey coverage, site forms require updating, and the community lacks an overall synthesis and interpretation of its social history. We report on our first season of a new, five-year collaboration, the Far View Archaeological Project (FVAP). The primary goal is to re-assess settlement on Chapin Mesa through a full coverage survey of the Far View community, a densely populated pueblo village centered on Far View Great House. We use modern high-resolution techniques, including GPS mapping

and drone-based photogrammetry, to record Pueblo habitations. We present the results from our first season when we recorded eighteen sites, including fifteen habitation sites and covered 38 acres. While many of these sites had been previously recorded, or were excavated by J.W. Fewkes in 1922 (Far View Tower), and by R. Lister and the UC-Boulder Field School (1954–56; 5MV866, 5MV875), we also identified three previously unrecorded sites. Preliminary results suggest there is a possible great house in Far View West.

Fields, Mara (Baylor University), Todd Ahlman (Texas State University), Grace Tolan (Rhodes College), Jon Russ (Rhodes College) and Stephen Carmody (Troy University)

[215]

Residue Analysis of Clay Tobacco Pipes from an Eighteenth-Century St. Eustatius Plantation

This study examines clay smoking pipes recovered from an eighteenth-century plantation sugar works (SE095) on the Dutch Caribbean island of St. Eustatius. The pipes are used to date the assemblage and gain a better understanding about acquisition, smoking, and discard practices of enslaved Africans who labored on the plantation. Results from residue analysis on pipe bowls gives insight into what people at the sugar works were smoking, confirming whether it was tobacco, a combination of plants, or other substances being smoked in the pipes. The results of the preliminary study pooled with residue analysis provide a clearer picture of the site history for the sugar works as well as the day-to-day personal activities of the enslaved Africans who lived and labored on the plantation.

Fields, Ronald

[69]

New Archaeological Data from Old Southwestern Caves

This research provides results funded by the New Mexico Archaeological Council and the Albright-Wirth Grants. This provides insight on an ancient votive offering practice that occurred in the American Southwest and in other regions in North America. The results of this ritual practice provides researchers with preserved atlatls, spears, bows, and arrows that may shed light on the technological change in ballistics from the atlatl/dart to the bow/arrow. Was the technological change the result of a gradual technological transition or an abrupt technological replacement? These results are preliminary at best but may provide one of many steps to answering this research question.

Filimoehala, Darby (International Archaeological Research Institute Inc.), Alex Morrison (International Archaeological Research Institute), Jennifer Huebert (International Archaeological Research Institute), Jon Tulchin (Kamehameha Schools, Wahi Kupuna Program) and Trever Duarte (Kamehameha Schools, Wahi Kupuna Program)

[262]

Stewardship, Community Engagement, and Archaeological Research: The Koehana of Ka'ūpūlehu

E 'ai i kekahi, e kāpī i kekahi. Eat some, salt some (Mary Kawena Pukui, 'Ōlelo No'eau No. 252). Kamehameha Schools (KS), a private Native Hawaiian organization and charitable educational trust, has stewardship of large archaeological collections from Ka'ūpūlehu, Hawai'i Island, generated by historic preservation-related archaeological work conducted from the late 1980s-early 2000s. KS management of these collections is guided by three principles: kūleana (responsibility) to mālama (care for) koehana (cultural material) collected from wahi kūpuna (ancestral sites), fostering sustainable archaeology, and looking to kūpuna (ancestors) to inform modern resource management. This has resulted in collaborations with Hawaiian and non-Hawaiian stakeholders, environmental groups, and archaeologists to develop a collections management plan for the curation of cultural material, assess research opportunities, and create strategies to engage KS beneficiaries. Archaeological outcomes have included the generation of zooarchaeological data to guide current marine stewardship efforts, the refinement of the settlement chronology for this area, and archaeobotanical research to inform community-based dryland forest restoration. As educational outreach, workshops have been conducted with students and community members and the results of collections-based archaeological investigations have been discussed at community meetings. The research and educational potential of these collections, however, is expansive.

Finley, Judson [26] see Freeman, Jacob

Finn, Elliot [84] see Lopez-Finn, Elliot

Fisch, Mike [232] see Mraz, Veronica

Fisher, Abigail (Southern Methodist University) and Lewanne French (Bluebonnet Animal Clinic)

[22]

Canine Dental Damage and Dental Pathology as Indicators of Changing Haulage Roles during the Transition to Agriculture

Dogs were an important resource for many Plains peoples, especially for the transportation of materials (e.g., timber, meat, water). The use of dogs for traction may have even facilitated high mobility in early North and South American populations. This high mobility eventually decreased with the introduction of agriculture across the northern Plains. Did the adoption of agriculture also change the roles of dogs and their significance as a hauling tool? This research assesses canine dental/mandibular damage and dental pathology on the northern Plains to investigate changing care, dietary, and husbandry practices associated with the adoption of agriculture. Dentition and cranial fragments are often the only surviving elements from canids in the archaeological record, and thus a significant source of data for the treatment of these animals. If dogs decreased in significance, there may be observable

changes in nutrition and treatment, reflected in dental development, observable trauma, and pathology.

[22]

Chair

Fisher, Chelsea (Washington and Lee University)

[46]

Pushing Back against the Greenwashed Agricultural Past

"Greenwashing" is advertising or marketing that misleads consumers into thinking that a product or company is environmentally responsible. Many allegedly "sustainable" global food corporations greenwash, and increasingly, they do so by drawing misleading connections between their products and the agricultural past. These corporations leverage particular portrayals of the agricultural past to sell food—effectively treating farmers as ahistorical, apolitical, and static. The past becomes a prop. This kind of greenwashing erases the ongoing legacies of Colonialism in modern food systems, and because it disproportionately affects Indigenous communities, it is an issue of environmental justice. So how can we push back? In this talk, I outline a call to action for environmentally conscious consumers to challenge the greenwashing of the agricultural past. Using global examples and my own experiences in archaeology and community engagement in the Maya lowlands of Yucatán, Mexico, I urge people to reclaim the agricultural past from the corporations as a pathway toward more environmentally just food systems at home and around the world.

[46]

Chair

Fisher, Erich (Arizona State University), Shara Bailey (New York University), Hayley Cawthra (Geophysics and Remote Sensing Unit), Irene Esteban (Evolutionary Studies Institute) and Stephan Winkler (iThemba Labs, Pretoria, South Africa)

[11]

Update on Research at the Site of Waterfall Bluff, Eastern Cape Province, South Africa

Excavations at Waterfall Bluff, South Africa document evidence of occupation in a persistent coastal context from MIS3 to the Middle Holocene. Remains of marine mollusks and fish show for the first time that coastal foraging was a component of some hunter-gatherer groups' subsistence practices during glacial phases in the Late Pleistocene, and that this practice continued into the Early Holocene. Here, we provide updates from recent excavations in deposits dating to the Last Glacial Maximum (26.5–19 ka), which show a complex depositional history of lateral (i.e., from the shelter outward) and vertical sediment accumulation over time. A complete LGM sequence has now been recovered from which we have recovered two human teeth (a molar and canine). Only three human remains in Africa date to the LGM, yet none are well-dated, and all come from questionable contexts. The precise sedimentological, geochronological, and archaeological context of our teeth is supported by laser total station and photogrammetric mapping, sediment micromorphology, and geochronology analyses using >40 radiocarbon ages and 5 OSL ages. Our robust radiocarbon sampling strategy now makes Waterfall Bluff one of the best dated sites from this time period in southern Africa.

Fisher, Kevin [263] see Kulick, Rachel

Fisher, Lynn (University of Illinois, Springfield)

[226]

Teaching the Climate Crisis in a General Education Course: What Can Archaeology Contribute?

With its comparative approach, time depth, and close intertwining of natural and social science perspectives, anthropological archaeology is a rich source of insights relevant to environmental issues and problem-solving today. However, environmental archaeology courses are typically upper-level electives that reach relatively small numbers of students, while introductory world prehistory texts devote few pages to contemporary issues. This paper examines lessons learned in many years of teaching a general education course that draws on prehistoric, historic, and sociocultural case studies to explore the history and diversity of human-land relationships. The goal of the course is to provide a deeper historical context for today's global challenges by studying the role of human activities and social/economic systems in shaping the historical, constructed landscapes of the world. Building on ideas from environmental education, I assign research projects allowing students to investigate a single place at several points in time, developing a sense of place and awareness of interactions between local and global processes at varying spatial and temporal scales. I analyze student projects and explore their informal self-assessments to identify aspects of the course that impact student learning and consider how archaeologists can do more to highlight contributions of the discipline.

Fisher, Philip (Washington State University)

[253]

Topographic Morphometric Analysis of Late Paleoindian Projectile Points: Goshen and Plainview of the Great Plains

Topographic morphometric analysis uses 3D models of projectile points to detect similarities and differences in flake scar patterns that result from tool production. In small hunter-gatherer populations, such as those during the Paleoindian period, flintknapping knowledge and technique would be passed from generation to generation. It is therefore expected that flake scar patterns should appear similar within a point type or between types that share a learning lineage of flintknapping knowledge. Topographic analyses can be used to address possible relationships of projectile point types that appear in chronological succession or that occur in adjacent geographic regions. This knowledge can assist archaeologists in resolving questions concerning cultural continuity or population replacement in the archaeological record. In this study, topographic morphometric analysis is applied to address the relationship of two unfluted Late Paleoindian lanceolate projectile point types: Goshen points from the northern Plains and Plainview points from the southern Plains. The results of this study, in conjunction with other archaeological data, suggest that these two point types are geographic expressions of a shared learned lineage of flintknapping knowledge and technique.

Fisher, Suzanne [56] see Harle, Michaelyn

Fitton, Tom (University of York, UK), Stephanie Wynne-Jones (University of York, UK) and Abdallah Ali (Department of Museums and Antiquities, Zanzibar)

[216]

Marking Time: Mapping Settlement and Urban Transitions on Zanzibar

This paper describes the ongoing archaeological investigation of Unguja Ukuu through the Urban Ecology and Transitions of the Zanzibar Archipelago Project (UETZAP). As one of the earliest Swahili settlements of the East African coast, Unguja Ukuu is an ideal location for exploring spatial and temporal transitions in processes of settlement and urbanism. We focus on the innovation of an archaeospatial methodology, combining multiple survey techniques with legacy data, to explore settlement growth, urbanism, and changes in environmental exploitation as part of a fluid process. Previous excavations have revealed keyhole stratigraphic sequences and broad phases of occupation, but the combination of new and legacy survey data with Bayesian modeling of excavated radiocarbon sequences has enabled a new consideration of the site's layout and growth, and the incorporation of environmental data enables discussion of the changing character of the site and ecological relationship of the Swahili inhabitants with their local environment. This analysis has prompted a discussion of the ways in which we conceptualise settlements on the basis of broad phasing, and draws attention instead to the idea of settlement on Zanzibar, as well as the wider East African coast, as an ongoing process of persistent, knowledgeable exploitation.

Fitzgerald, Curran (University of North Carolina, Greensboro)

[260]

Beasts of No Nation: Animals and Exchange during the Late Intermediate Period in the Moquegua Valley, Peru

The traditional characterization of southern Peru during the Late Intermediate Period (LIP) as a landscape of ceaseless violence and political fragmentation suggests a general breakdown in the infrastructure of subsistence following the collapse of the Middle Horizon Wari and Tiwanaku polities. Such interpretations portray a crude devolution in land use from engineered state agricultural regimes to struggling LIP agropastoralists, the collapse of state-facilitated exchange networks, and shrinking spheres of interaction driven by settlement nucleation and internecine conflict. This paper presents the preliminary results of faunal analyses from LIP assemblages in the Moquegua valley of southern Peru that appear to contradict this narrative. Domestic faunal assemblages from excavations at Las Peñas and Cerro Capanto indicate that both marine and highland resources were part of the quotidian diet of LIP inhabitants of the upper Moquegua Valley, while a sample of faunal remains from mortuary contexts in the middle Valley further suggests broad relationships of complementarity during this period. These data suggest that, far from "just surviving" in a landscape irreconcilably fractured by state withdrawal and collapse, LIP inhabitants of the Moquegua Valley forged far-reaching relationships of complementarity and exchange that had not been possible under the strictures of state hegemony.

Fitzhugh, William (Smithsonian), Michael Mlyniec (Smithsonian) and Igor Chechushkov (Smithsonian)

[50]

More Than Just a Pot: The Social Life of Soapstone Vessels among the Southern Labrador Inuit

Throughout the Canadian Arctic and Greenland soapstone (steatite) oil lamps and cooking pots were a common and crucial component of Inuit daily life. Maintaining a houseful involved elaborate behavior structured around the hearth and its technical and social components. Despite their importance and their ubiquitous presence in archaeological sites, soapstone vessels have received little scholarly attention. This paper featuring data from excavations at seventeenth to eighteenth-century Inuit sites along the Quebec Lower North Shore explores material, social and ritual aspects of this technology in a context of early European contact and culture change, when soapstone vessels were being replaced by copper and cast iron pots. Issues involved in this conversion include sourcing, manufacture, transport and exchange, mechanics of use, heat sources, breakage and repair, spiritual life, and ritual disposal. Soapstone cookware was expensive and highly curated; yet its end-of-life remains are common archaeological finds. While mostly focusing on the historical Southern Inuit, the use of soapstone vessels among Labrador Inuit, Thule, and Dorset cultures, and from Inuit oral history and ethnography, provide comparative perspective.

Fitzmaurice, Rosamund (University College London), Tia Watkins (University College London), Claire Ebert (Northern Arizona University) and Jaime Awe (Northern Arizona University)

[130]

Ancient Games: New Evidence of Patolli in Xunantunich, Belize

Patolli is a Mesoamerican board game best known from written Spanish accounts during the time of conquest and thereafter. Growing archaeological evidence of the game in Maya lowlands during the Terminal Classic period (AD 750–900/1000) is increasing our knowledge of patolli in Pre-Columbian times. In this paper we discuss new evidence of patolli documented in structures surrounding Plaza A-III at the Classic period Maya city of Xunantunich, located in the Belize River Valley region of west-central Belize. Like other elite spaces at Xunantunich, many of the excavated rooms in structures surrounding the elevated plaza, composing the site's northern palace group, contain partial or complete patolli boards incised on terminal phase architecture. We compare these data from Xunantunich to other patolli boards across the Belize River Valley to address questions about formal and functional characteristics of these features. We also discuss the timing of the introduction of patolli in the Belize Valley, the socio-political implications of its Terminal Classic introduction into this region, who may have played the game, why it is predominantly found in elite spaces, and from where it may have originated.

Fitzmaurice, Rosamund [178] see Saldaña, Gabriela

Fitzpatrick, Leslie (Mercyhurst University), Emma Bonthorne (Aditu Arkeologia), Danee Wilson (Aditu Arkeologia) and Fran Valle de Tarazaga (Aditu Arkeologia)

[240]

Stable Isotopic Examination ($\delta^{18}\text{O}$, $\delta^{15}\text{N}$, $\delta^{13}\text{C}$) of Human Remains from the Monastery of Santa María de Zamartze, Uharte-Arakil Municipality, Navarre Chartered Community, Spain

An initial subset ($n = 5$) of the human remains ($N = 155$) recovered during the 2011 to 2015 excavation seasons from the Monastery of Santa María de Zamartze burial grounds were analyzed for stable oxygen, nitrogen, and carbon isotopes derived from bone and tooth carbonate and collagen. As this site is positioned in close geographic association with a medieval religious pilgrimage route and several of the individuals were recovered with probable religious-based burial goods, the stable isotope analyses conducted for this investigation elucidate the probable geographic region of origin for the individuals sampled. Mobility profiles across the life histories of these individuals as well as dietary profiles are examined as well. This preliminary research contributes to the emerging stable isotope dataset for this territory in Spain and constitutes some of the primary data related to the medieval period in Navarre.

Fitzpatrick, Scott (University of Oregon)

[100]

Chair

Fitzpatrick, Scott (University of Oregon) and Christina Giovas (Simon Fraser University)

[271]

*Sociocultural Dynamics of Surf Clam (*Atactodea striata*) Intensification and Fishing Declines at Chelechol Ra Orrak Rockshelter (Palau, Micronesia)*

Analysis of a large molluscan assemblage ($\text{MNI} > 15,000$) from the Chelechol ra Orrak site in Palau, Micronesia provides important insight into prehistoric marine subsistence strategies between ca. 3000–0 BP. During the first two millennia of site use, surf clams (*Atactodea striata*) and humped conch (*Gibberulus gibberulus*) increase significantly, accounting for the majority of molluscan remains. Surf clams especially dominate the assemblage and show a continued, dramatic rise in numbers between ca. 1000 and 0 BP, at the same time that virtually all other taxa decline. Although this trend reflects increased foraging emphasis on the sandy littoral/shallow sublittoral zone where *A. striata* may be collected, because other nearshore molluscan taxa do not increase, the pattern suggests selective intensification of surf clams alone. We evaluate Medieval Warm Period and Little Ice Age associated climate change and anthropogenic “overharvesting” (exploitation depression) as potential causes of *A. striata* intensification, but conclude that neither explanation is supported. Alternative sociocultural variables may be responsible for the archaeomalacological patterning observed at Chelechol ra Orrak. Taken together with previous human paleoecology studies for Palau, the findings presented here demonstrate the potential for a range of effects associated with long-term human-environment interactions in these islands.

Fitzpatrick, Scott [271] see Ardren, Traci

Fitzpatrick, Scott [135] see Hanna, Jonathan

Fitzpatrick, Scott [59] see Jorissen, Philippa

Fitzpatrick, Scott [123] see Lawrence, John

Fitzpatrick, Scott [100] see Napolitano, Matthew

Fitzpatrick, Scott [100] see Ono, Rintaro

Fitzpatrick, Tony (University of Wyoming)

[75]

Collagen and Apatite Stable Isotope Values from Bison Bone at the Hell Gap Site

This work adds collagen $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ to the apatite $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ values previously presented by the author, as well as C:N ratios demonstrating the viability of many samples from Hell Gap. Bison bone can be found throughout Paleoindian deposits at the site, providing a possible proxy for regional climate change. Carbon ratios for collagen samples ($n=23$) range from -19.08‰ to -14.60‰, and apatite, which is currently a smaller subset of samples ($n=13$), from -9.4‰ to -6.5‰. Apatite-collagen spacing of carbon is between 8‰ and 10.41‰, with an average of 9.23‰. Apatite $\delta^{18}\text{O}$ values range from -10.2‰ to -8.0‰ and collagen $\delta^{15}\text{N}$ from 5.15‰ to 10.62‰. These data are compared with existing paleoclimate information from Hell Gap and the surrounding area.

Flad, Rowan (Harvard University)

[45]

Chair

Fladd, Samantha (University of Colorado, Boulder), Adam Watson (American Museum of Natural History), Vernon Scarborough (University of Cincinnati) and R. Gwinn Vivian (Arizona State Museum)

[98]

Implications of Agricultural Practice for Chaco Society

The extent and effectiveness of agriculture in Chaco Canyon, New Mexico has long been debated in Southwest archaeology. The environmental marginality of the canyon, particularly limited access to water, and questions over population size during the Pueblo II occupation (800–1150 CE) continue to dominate discussions of the sociopolitical development of the canyon. Guided by Stephen Plog's vision and his unwavering belief in the value of the data-rich legacy documentary record, the formation of the Chaco Research Archive constitutes a major watershed in Chaco archaeology. The unprecedented access to the near-entirety of original excavation records has spurred renewed archaeological investigations, which, in turn, have fundamentally altered our reconstructions of Chaco society. One such recent research project yielded the revelation that several cultural features previously

assumed to date to the 1000s “fluorescence” were in fact formed at least a century earlier, profoundly reorienting our understanding of the regional chronology. In this paper, we combine research on water management and agricultural practice with this new understanding of Chaco chronology to discuss the implications for local sociopolitical development and organization. Following Dr. Plog’s lead, we emphasize the importance of reanalyzing and reinterpreting existing data in order to improve our reconstructions of the past.

Fladeboe, Randee (University of Florida), Kitty Emery (Florida Museum of Natural History), Erin Thornton (Washington State University) and Camilla Speller (University of British Columbia)

[129]

Further Investigation of Turkey Wellness and Treatment in Mesoamerica

It is well-established that the turkey occupied a prominent and multivalent role in several different prehistoric Mesoamerican societies, referenced by numerous remains found at archaeological sites across this region. This paper revisits the ongoing construction of a health profile of domesticated turkeys based on skeletal remains gathered from an expanded database of Maya and Central Mexican sites, in order to assess and compare regional differences in turkey treatment and use. Building on previous studies, we have continued to gather data on pathology and morphometrics using computer tomography (CT) scanning. We synthesize this information with data gathered from isotopic and aDNA evidence in order to review distributions of sex and species, and identify variations in the nutritional support and management of Mesoamerican turkeys between different sites.

[129]

Chair

Flanagan, Kelin (Archaeological Consulting Services Ltd.), Astrid Runggaldier (University of Texas, Austin) and Samantha Krause (University of Texas, Austin)

[14]

Maya Structures for Wet and Dry Seasons: Adaptive Strategies and Microenvironments at the Site of Chulub in the Crooked Tree Lagoon System

This study evaluates interrelationships between two ancient Maya structures excavated at the Terminal Classic-Early Postclassic site of Chulub, located on the shores of a lagoon in the wetland environment of Crooked Tree island, Belize. Both structures are associated with a linear depression that is seasonally inundated with water. We examine a comparative framework of analysis of features known as “pocket bajos” identified in other recent investigations at the northern Belize site of Aventura, which can serve as a parallel for similarly integrated human-environment relationships at Chulub during the same time period. Pocket bajos at Aventura were integral for a variety of subsistence practices, blurring the lines between agriculture and opportunistic resource gathering. We delineate the material assemblages and spatial layouts from excavations at Chulub, and in addition present the outcome of a sediment sampling strategy, addressing our questions on the nature of the depressions as water features coeval with site occupation. We further explore the implications of adaptive strategies like seasonal aquaculture, and posit that the structures at Chulub, and by extension the human activities that took place there, need to be understood in direct relationship with the geological and microenvironmental features of this lagoon system.

Flegontov, Pavel (University of Ostrava, Czechia), Leonid Vyazov (Kazan Federal University) and Airat Sitdikov (Khalikov Institute of Archaeology)

[173]

Managing the Explosive Growth of Archaeogenetics: Admixture Graphs and Graph-Based Archaeological Databases

Archaeogenetics is now undergoing a period of explosive growth. However, this rapid growth creates problems. Human history from the genetic perspective is a complex graph of population splits and “gene flows”, but many studies do not explore graphs directly, relying on ordination methods and allele or haplotype sharing statistics instead. Thus, the first problem is the lack of standardized and universally accepted protocols for testing complex graph models. Another problem encountered in quite a few studies is imbalanced and quasi-random sampling across archaeological sites and periods that makes even the most sophisticated genetic analyses of limited use for understanding history. We believe that archaeogenetic sampling should be driven by historical questions and guided by a global database cataloguing archaeological sites and all kinds of associated information, including genetic data and results of genetic analyses. We have developed a graph-based database on the Neo4j platform (<https://www.culturetat.info/>) that allows integrating virtually any type of data associated with an archaeological site. Currently the database is focused on archaeological sites in the Volga basin (Russia), but it has a potential to function as a “social network” for scientists worldwide, which would bring about its rapid growth.

Fleisher, Jeffrey (Rice University) and Joe Merchant (Rice University)

[249]

Indian Ocean Glass Beads from Miyoba Mound in the Kafue River Floodplain, Zambia

This paper reports on an assemblage of Indian Ocean glass beads excavated from the Middle Iron Age mound of Miyoba in western Zambia at the hook of the Kafue River. Miyoba was a long-occupied settlement during the late first and early second millennium AD represented by approximately 5 m of occupation debris that include house floors, midden deposits, and iron smithing debris. The assemblage contains 115 glass beads; most are glass beads with finished ends, with a small number of wound beads. The deepest stratigraphic glass bead is a garden roller, likely imported from K2 in South Africa—this is the northernmost find of a garden roller to date. We will describe the assemblage, examine the chemical signature of a sample of these beads and their connections to previously established bead series, and discuss the implications of the trade in Indian Ocean beads in the far inland for early second millennium Zambia.

Fleskes, Raquel (University of Pennsylvania), Graciela Cabana (University of Tennessee, Knoxville) and Theodore Schurr (University of Pennsylvania)

[169]

Genomic Insights into Kinship and Labor at Seventeenth-Century Patuxent Point, Maryland

High mortality and low birth rates led to a primarily migrant population of Europeans settling in early seventeenth-century Maryland, raising questions about the extent to which kin groups influenced labor and settlement strategies at early plantation sites. To explore this issue, we analyzed the biological histories of 18 individuals buried at the Patuxent Point site in southern Maryland. Midden excavations indicated that the site was occupied by members of the middling planter class, who occupied the site from ~1650 to 1680 CE. Two burial clusters separated by two isolated burials suggested the presence of domestic households, prompting investigations into the existence of families, indentured servants, and/or enslaved African individuals there. To further elucidate their biological relationships, we extracted DNAs from all 18 of individuals. The DNA extracts were enriched for human genomic DNA and subjected to next-generation sequencing, with the resulting data being statistically analyzed to explore genetic diversity and kinship in the samples. After situating these data within existing archaeological and osteological evidence, we are able to reconstruct the mortuary patterns of the Patuxent Point site as they relate to labor and migration strategies in seventeenth-century Maryland.

Fletcher, Roland (University of Sydney)

[28]

Discussant

Fletcher, Roland (University of Sydney)

[48]

Urban Network Resilience and Fragility

Residential densities within the settlements of sedentary communities vary between about 1,000 persons/ha and less than 10 persons/ha. Some regional settlement networks consist predominantly of settlement with compact, high density residence patterns while others are dominated by settlements with dispersed, low-density residence patterns. Compact settlement networks display substantial resilience. While individual settlements may fail the networks continue. By contrast networks of settlements with dispersed occupations patterns tend to fragment after the demise of the major settlements. New networks form away from the former metropolitan heartland regions as can be seen following the ninth-century CE demise of the Classic Maya network and the fourteenth-fifteenth century CE demise of Angkorian empire network. The resilience of compact urban settlement networks has appeared to be normal and unproblematic. But now the very different futures of networks of dispersed settlements are known the differing network outcomes require explanation. Once compact urbanism is present in a region its networks generally appear to be permanent. But what of the Harappan network? Conversely the overlap of the Pre-Classic to the Classic Maya dispersed urban network may be of great significance for dispersed settlement networks. There are some implications for the future of present-day urban networks.

[48]

Chair

Flood, John (Indiana University East), Edward Herrmann (Department of Earth and Atmospheric Sciences), Scott Hipskind (Cardno) and Jeremy Wilson (Indiana University)

[232]

Household-Level Stone Tool Economies among Illinois Valley Mississippians: A Case Study from the Lawrenz Gun Club Site

Archaeological excavations at Lawrenz Gun Club, a fortified Mississippian Period village in west-central Illinois, have provided a context for examining the daily lives of those who lived there from the late eleventh through the early fourteenth century AD. As part of a larger research project examining the founding, florescence, and eventual abandonment of the largest Mississippian village in the central Illinois River valley, this study focuses on diachronic changes in lithic raw material procurement and use, as well as stone tool manufacturing, associated with domestic structures. The data indicate that while early households at Lawrenz (AD 1050–1200) relied almost solely on the widely available Burlington chert, the locally available La Moine River chert became increasingly important during the thirteenth and fourteenth centuries. The analyses also indicate that these late Mississippian households at Lawrenz relied more heavily on Mill Creek chert for agricultural activities and invested more energy into the production of formal tools rather than expedient flake-based tools. These diachronic data suggest villagers developed a more formalized approach to their flaked stone economy during the latter half of Lawrenz's occupation.

Florence, Kathryn

[164]

Dancing with Death at Monte Alban: Interconnected Polities and Violence in a Disembedded Capital

In terms of Mesoamerican violence, the sacrificial practices of the Aztec Triple Alliance and Maya polities come to mind. However, these studies overlook the manifestations of violence that existed in the Oaxaca region of Mexico in the Formative/Preclassic period. Relatively obscure outside of Latin American archaeology, the site of Monte Alban was one of the first inter-regional cosmopolitan centers in Mesoamerica, rising to prominence between 100 BC and AD 200. The site gained influence over the Oaxacan highlands, but also came into conflict with polities beyond their boundaries that ultimately ended in war. Here I show how Monte Alban used visual representations of violence and death in the Danzantes reliefs as a tool for demonstrating their control over far-flung populations that were now subservient to a disembedded capital. These stone slabs display the artistic rendering of the dismembered bodies of slain combatants, standing as a metonym for the defeated city-state. I propose that by showing them so openly at a site where there would be representatives of the defeated and possible political allies, Monte Alban was enacting violence itself, resulting in a threat of domination and the promise of subjugation to their regime.

Flores, Alexandra (University of Oklahoma)**[78]***Analysis of Results from a Geophysical Survey Conducted at the Brackett Site (34Ck43) in Eastern Oklahoma*

This poster presents the results of a multi-sensor geophysical survey conducted at the Brackett site (34CK43) located in northeastern Oklahoma. The Brackett site is a Harlan Phase (AD 1150–1250) Spiro-related mound site that was excavated by the Works Progress Administration (WPA) during the late 1930s. This project is the first geophysical survey that has been performed at Brackett, utilizing magnetometry, ground-penetrating radar, and electrical resistivity. These results reveal anomalies that are consistent with archaeological features typical of the Spiro region, as well as anomalies that are indicative of remnants from the WPA excavations. A landscape approach is taken to examine how Brackett fits into the larger Spiro region.

Flores, Jorge (Binghamton University [SUNY])**[257]***Salt Exploitation in the Northern Ecuadorian Highlands: Beyond the Economic Benefits*

Salt studies in Ecuador are limited, however, important contributions about the exploitation and trade of this resource have been analyzed by outstanding ethnographic and ethnohistorical efforts. These efforts have suggested that salt production was exercised under a system of multi-ethnic colonies controlled by centralized institutions in order to consolidate the economic and political aspects of larger administrative entities. Such affirmation has been analyzed under premises shaped by an environmentalist determinism which emphasize on the accessibility to this resource and the political structure behind such activity. Archaeologically, salt influences over the population on the northern Ecuadorian Andes have not been fully explored yet, and the lack of alternative perspectives are also less evident. However, in this presentation, I will show preliminary data about how salt was able to transform not only the economy of the Chota-Mira Valley region but also how salt was able to transform bodies and different social aspects of daily life. This preliminary work seeks to demonstrate that salt facilitated, persuaded and organized Santa Catalina de Salinas by connecting people and things. The main goal is to understand how salt acted as a generative force in the creation and organization of local communities over changing historical circumstances.

Flores, Mary Faith [129] see Conrad, Cyler

Flynn, Barrett [52] see Skinner, Dougless

Flynn, Erin (PAL)**[176]***Mining Diamond Hill Resource Area: A Precontact Quartz Quarry in Northern Rhode Island*

Although we have not found diamonds, we have recovered an overwhelming assemblage of quartz artifacts from the Diamond Hill resource area. This area appears to have provided precious lithic resources to Native American inhabitants during at least the Archaic period. The Pine Swamp Quarry site was identified during an archaeological survey for an electrical transmission line in 2018. Additional investigations revealed several fire-related features at the site, raising questions about the extent and use of this resource area beyond lithic extraction. Modern quarrying in the area may have erased traces of the pre-contact quartz source, but the recovered assemblage from the Pine Swamp Quarry site contributes to our understanding of extraction technologies and raw material and campsite selection, and to the overall narrative of past occupations in the Diamond Hill area. Recovered evidence suggests that site use spanned several millennia, over which varied tool forms were preferred and/or replaced, as has been seen at other recorded quarry sites in the general vicinity. Diamonds are forever, and quartz, too.

Foias, Antonia (Williams College)**[126]***Maya Polychrome Production and Exchange in the Southern Lowlands: Lessons from the Ik' Polychrome Style of Motul de San José*

Debates on the nature and scale of the Classic Maya economic systems have been ongoing, and especially in relation to Maya polychrome traditions. Of these polychrome traditions, the Ik' Style of Motul de San José is probably the most famous. Since 1998, I have worked with Ron Bishop on the chemical, stylistic and contextual analyses of Ik' Style vessels found at Motul de San José and beyond. The discovery of refuse from a ceramic workshop attached to the royal palace at Motul in 1998 has provided extraordinary opportunities to reconstruct Maya polychrome production in conjunction with INAA chemical analyses. This paper will describe the results of these long-term studies, focusing on the wasters and other polychromes from the palace workshop. Clays sampled across Motul's region were also submitted to INAA, and allow us for the first time to directly connect pottery production with regional clay sources.

Foias, Antonia [54] see Emery, Kitty

Folan, William (Univ. Autónoma de Campeche), Joel Gunn (University of North Carolina, Greensboro) and Maria del Rosario Dominguez Carrasco (Univ. Autónoma de Campeche)**[168]***The Importance of Neutron Activation Analysis in the Study of Ceramic Vessels and Clay Figurines of Calakmul, Campeche*

Analyses performed by neutron activation on a wide collection of ceramic sherds and figurines provided important information related to the origin of the raw materials used for the manufacture of these objects through trace elements. The objects were recovered from various structures in the central core of Calakmul, Campeche (I, II, III and VII). These data also allowed us to

visualize types of social and political relationships and the level of exchange of goods, that Calakmul maintained with other sites in the Maya area. Most productive in this regard were orange and fine gray ceramics that originated in the Usumacinta region. One of the vessels was of the codex-type discovered in a funerary context. Its analysis showed that it was manufactured in the nearby site of Nakbe, in a place identified as a possible production site of this type of prestigious ceramic.

Folk, Maureen (Binghamton University), Sarah Baitzel (Washington University, St. Louis) and BrieAnna Langlie (Binghamton University)

[61]

Migration and Agricultural Practice: A Paleoethnobotanical Analysis of Los Batanes in Southern Peru

For centuries, people have moved to new locations carrying agricultural and botanical knowledge with them, while adapting to their new environments. In the lowland valleys of the south-central Andes, altiplano populations encountered and adopted new plant resources into their diet alongside existing agricultural practices and cuisine. During the tenth–twelfth centuries, AD Tiwanaku-affiliated agropastoralist Cabuza communities established the site of Los Batanes in the middle Sama Valley, Peru, (500 masl), occupying a strategic location in a temperate oasis valley with access to the Pacific coast. Preliminary analysis of paleoethnobotanical samples show that residents of Los Batanes cultivated or had access to chili peppers, chenopods, other domesticates and wild plant resources in addition to maize. In order to understand plant availability and uses in the valley, we constructed a vegetative comparative collection from the middle Sama valley to understand plant use in the region today and how it has changed over the past millennium. This study reflects on current understandings of Tiwanaku-affiliated plant use to identify how Cabuza people transformed subsistence practices to reflect a negotiation of immigrant origins and emergent identities.

Follensbee, Billie (Missouri State University)

[2]

Diamond in the Rough: Olmec and Olmec-Related Occurrences of the Rhombus Motif and Its Variations

As ancient cultures throughout the world developed textiles, knotted and woven fabrics lent themselves to the development of geometric rhombus patterns, first as the diamond-shaped mesh of knotted nets and later as square patterns in plain-weave cloth. Further early experimentation in basketry and cloth twill weaves led to the development of chevron, triangle, zigzag, diamond, and diamond-and-dot motifs. Scholarly research has identified and discussed these textile motifs throughout the ancient Americas, further revealing how these patterns were recognized and meaningful, with links to gender, affiliation, and status. Little research, however, has been conducted on rhombus textile motifs in Formative period Mesoamerican cultures such as the Olmec. This is in great part because direct evidence of Olmec textiles is scanty, consisting of only a few fragments of cordage and woven mats, two fabric-impressed clay sherds, and artifacts recently identified as tools for the manufacture of textiles. Close analysis of this existing evidence, along with the identification of these textile motifs in Olmec ceramics, sculpture, and architecture, reveals that rhombus and related patterns are strongly in evidence in the Formative period, and that as with later Mesoamerican cultures, these motifs likewise held deep, symbolic meaning for the Olmec.

[2]

Chair

Follensbee, Billie [191] see McElfresh Buford, Katie

Ford, Anabel (UCSB)

[31]

Discussant

Ford, Anabel (UCSB)

[124]

Intensification without Modification: Tropical Swidden and the Maya

As we look at the development of a domesticated landscape and agriculture, and the archaeological correlates, we need to understand that capital based investment and arable farming are only one path to intensification. Labor based economies, particularly those of the Americas before European conquest, present an entirely distinct track toward domestication. Tropical settings in general, and the Maya in particular, demonstrate a mastery of nature, cultivating biological capital as a product of their culture. Embedded fields transform to forests in a poly-cultivation practice that emphasize diversity that prevails in the tropics. The Maya milpa cycle reduces temperature and evapotranspiration, conserves water, promotes biodiversity, builds fertility, inhibits erosion, and nurtures people. These labor investments do not leave direct traces on the landscape, save the implicit density of settlement.

Ford, Anabel [7] see Horn, Sherman

Ford, Ben (Indiana University of Pennsylvania) and William Chadwick (Indiana University of Pennsylvania)

[213]

Preliminary Results from Newport Site (36IN188)

Newport village was founded in circa 1787 to facilitate movement of people and goods from Pennsylvania's early road system to riverine highways. The town was largely abandoned by 1840, but contained several taverns, blacksmith shops, and infrastructure for loading boats on, and crossing over, the adjacent Conemaugh River. At its height approximately 30 families lived in the village and were served by a store and U.S. Post Office. As an early settlement in western Pennsylvania, linked directly to the development of transportation and trade in the region, this site contains important information about the frontier period of the Midwest. Recent excavations at the site have begun to determine the site boundaries, identify the street layout, and investigate the village store to better understand local trade. These excavations also revealed evidence that the landscape was settled by Native Americans

centuries, and possibly millennia, earlier.

Ford, Paige (University of Oklahoma) and Shawn Lambert (Mississippi State University)

[47]

Who Is Making These Pots? Stylistic and Iconographic Analyses of Early Caddo Fineware Pottery from Cahokia

This paper investigates early Caddo-Cahokian connections through the iconographic and stylistic analyses of early Caddo fineware pottery found in both Caddo and Cahokia contexts. We address questions concerning ceramic production and distribution to shed light on whether finewares were produced by Caddo potters who lived and worked at Cahokia, were produced by local Cahokia potters who copied Caddo motifs, or if the vessels were brought to Cahokia from the southern Caddo area. This investigation will help us to better understand the nature of Caddo-like vessels at Cahokia and provides a means of identifying and interpreting new levels of social interactions between the Caddo world and Cahokia.

Ford, Paige [97] see Newton, Kathryn

Forest, Marion (Brigham Young University) and Andrew Somerville (Iowa State University)

[133]

Return to Hacienda Metepec: Exploring Continuity and Change at Teotihuacan

Recent archaeological research in Central Mexico has examined the transformations of prehispanic communities during the Epiclassic period (AD 550–850) from the perspective of Teotihuacan's neighboring settlements and peripheral regions. Less attention, however, has been given to the concomitant structural changes that occurred within the urban settlement itself. Excavations conducted in 1979 by Evelyn Childs Rattray at Hacienda Metepec (9:N1E7), near the eastern edge of Teotihuacan urban core, yielded important archaeological data relevant to understanding the Classic-Epiclassic transition and to better characterizing the economic, ritual, spatial, and demographic transformations at the site. Surface collection data from the Teotihuacan mapping project and Rattray's excavations demonstrate a continuous stratigraphy at Hacienda Metepec from the Classic to the Postclassic periods and the presence of a sizable Coyotlatelco (Epiclassic) phase occupation. In this paper, we synthesize previous research conducted at Hacienda Metepec and discuss the importance of this data within the context of our current knowledge of the Classic-to-Epiclassic transition and in light of current hypotheses regarding these changes. Finally, we present an outline of future field research at Hacienda Metepec.

Forget Brisson, Laurence (Université du Québec à Montréal), Michel Lamothe (Université du Québec à Montréal), François Hardy (Université du Québec à Montréal) and Kelly Graf (Texas A&M University)

[81]

Contributions of IRSL and ¹⁴C Geochronology to the Issue of Initial Settlement in the New World: The Case of the McDonald Creek Archaeological Site

The McDonald Creek archaeological site from central Alaska (USA) has been dated using Optically Stimulated Luminescence (OSL) in order to document the initial settlement in the New World. Eolian sediment samples (loess) from stratigraphic profiles have been systematically dated using this method and have been compared to the radiocarbon ages of the different human occupations present at the site. The interpreted geochronology suggests an initial human occupation of the area at the end of the Upper Pleistocene, which is in good agreement with the regional archaeological framework. A measurement protocol for the luminescence dating method with infrared stimulation (IRSL) has been developed to obtain accurate and reliable results for the minerals extracted from these late glacial loess sediments. The LPH-IRSL (low temperature preheat IRSL) protocol thus allows in this case the establishment of a detailed geochronological framework for the Central Alaska region. A relationship can be made between the eolian sedimentation rates and the territorial habitability patterns of the early human groups present in central Alaska. This relationship is implicitly relating paleoenvironments to regional climate changes, since loess accumulation rates can be directly correlated with the glacial history of the region, especially with the fluctuating position of the ice margin.

Forkel, Robert [262] see Hermann, Aymeric

Forman, Steven [19] see Esker, Donald

Forman, Steven [229] see Plumlee, R. Scott

Forman, Steven [19] see Sun, Nan

Forman, Steven [8] see Tew-Todd, Victoria

Forrest, Daniel (PAL Inc.)

[13]

Occam, Rorschach, and Schrödinger Walk into a Bar: Reflections on a Twenty-Year Conversation about the Early Holocene Archaeology in New England

The early Holocene archaeological record of New England is a stubborn beast. It resists our efforts to describe coherent geographic, technological, or temporal patterns spanning the Late Paleoindian and Early Archaic periods. While the past twenty years have witnessed a remarkable advance in our understanding of the Paleoindian occupations in the region, the earliest Archaic manifestations remain enigmatic, heterogeneous, and frustratingly disconnected from the preceding and succeeding cultures. This was not what two young archaeologists believed would happen when we jumped into the "Hollow Scene" fray of the '90's, driven by discoveries of two important sites dating to the Late Paleoindian and Early Archaic. Brian Jones and I agreed that a diverse cultural landscape characterized New England after 11,000 cal BP. We disagreed about how difficult it would be to convince our peers and why.

Forrest, Daniel [232] see Kelly, John

Forste, Kathleen (Boston University), Susan Allen (University of Cincinnati), Jean Berkebille (U.S. Forest Service, Apache-Sitgreaves NF) and Martha Wendel (University of Cincinnati)
[255]

Seeds and Stems on the Edge of Splendor

In this paper we use standardized and relative statistics to analyze archaeological plant remains (seeds, plant parts, and wood charcoal) from a Late Pueblo II (AD 1050–1100) multi-room house of the Upper Basin (MU 125), located in the pinyon-juniper forests of northern Arizona just south of the Grand Canyon. Through the analyses of multiple lines of archaeobotanical evidence, we address both cultural and ecological questions. We infer the occupants' subsistence strategies and the spatial organization of subsistence activities, in the context of the ecological conditions around the site. This targeted, spatially intensive investigation of humans' economic resource production and their interaction with their vegetated surroundings enables us to understand the variability of subsistence strategies implemented in the prehispanic Southwest, and their impacts on ecosystem history. Specifically, we provide evidence supporting the importance of small-seeded ruderal plants that are often dismissed as intrusive "seed rain" based on qualitative rather than quantitative assessment, as well as the importance of fire in propagating the region's most important economic plants.

Fort, Mathew [233] see Simon, Mary

Forton, Maxwell (Binghamton University)
[148]

Landscape of Shields: Regional Trends in Shield Iconography in the Late Pueblo III World

The Late Pueblo III period on the Colorado Plateau was a time of great social and environmental change and uncertainty for ancient Pueblo populations. One response to this regional unrest was the depiction of shields in pictographs and petroglyphs, often in association with defensive cliff dwelling communities. This shield imagery is interpreted as apotropaic wards, clan symbols, expressions of warning to outsiders, or some combination of these functions. Prior research demonstrates certain ancient Pueblo populations developed distinct spatial practices of where shield imagery was placed on sites, reflective of populations coalescing into regional social units. This poster expands upon this spatial study to see if different ancient Pueblo populations had preferences for specific decorative designs adorning shields or particular forms of shield bearers in pictographs and petroglyphs. This study assesses whether Late Pueblo III communities expressed aspects of identity and social organization in their depictions of shields. Distinct regional patterns for shield designs supports a fracturing of the Late Pueblo III world into distinct social units, while designs shared across the Colorado Plateau indicate shared pictorial traditions across social and geographic boundaries. I aim to demonstrate how iconography has a place in holistic studies of social organization in Southwest/Northwest archaeology.

Forton, Maxwell [122] see Margotta, James

Foster, Spencer
[178]

Beyond Stone: Organic Alternatives for Atlatl Dart Points among the Classic Lowland Maya

During the Classic period (250–900 CE), the atlatl, also known as a spear or dart thrower, was the predominant projectile weapon of the lowland Maya. It remained as such until the Postclassic (900–1500 CE) when bow and arrow technology entered the region. However, despite the atlatl's dominance as both a tool of war and hunting, archaeological excavations in northern Belize recover relatively few stone points. My research studied the potential use of organic materials as alternatives for chipped stone projectile points among the lowland Maya. Bone, wood, and bamboo rarely survive the processes of time in the subtropical climate of the region and would not appear in the archaeological record except under exceptional preservation conditions. My research applied elements of experimental archaeology to help determine if these materials could be used as functional replacements for stone projectile points. By replicating atlatl and dart designs from historic, ethnographic, and archaeological sources and testing their capabilities, I tested the effectiveness and convenience of the organic materials as projectile points.

Fournier, Nichole, Erin Thornton (Washington State University), Shannon Tushingham (Washington State University), Cara Monroe (University of Oklahoma) and Alan Leventhal (San Jose State University)
[233]

Childhood Diet and Life History Patterns of Late Holocene Populations in the San Francisco Bay Area

Children's diets have been reconstructed from five Late Holocene San Francisco Bay Area sites (CA-ALA-329, CA-SCL-134, CA-SCL-215, CA-SCL-623, and CA-SCL-870), based on the carbon and nitrogen isotopic composition of bone and dental tissues. The occupation of these sites corresponds with significant socioeconomic changes as well as environmental fluctuations associated with the Medieval Climatic Anomaly (MCA). Previous reconstructions of adult diets show a transition from a largely marine-based, to a mainly terrestrially-based economy during this time. In the present study, childhood dietary information is explored during this same temporal period in order to ascertain whether children's diets, too, were affected by these major socioeconomic and environmental changes. Diet during infancy and early childhood speaks to certain life history events, such as age-at-weaning and the age at which children begin acquiring the majority of their calories themselves. Therefore, it can have a large impact on people lasting throughout their lifetimes. Results indicate early ages of the onset of both weaning and independent foraging. Potential reasons for these findings, as well as their significant implications, will be discussed.

Fowler, John [76] see Guiry, Eric

Fowler, William (Vanderbilt University)

[90]

Moderator

[90]

Discussant

Fox, Amy (University of Toronto)

[23]

Broadpoint Typology of the Late Archaic Period in Eastern North America: On the Snook Kill, Atlantic, and Lehigh/Koens Crispin Varieties

Northeastern North American regional typologies define three related types of broadpoint: the Atlantic point in the Maritimes and New England, the Snook Kill point in New York and Ontario regions, and the Lehigh/Koens Crispin point in the Susquehanna and Delaware River valleys. Each point existed at the same time and was made on locally available raw materials. A sample of 246 broadpoints all defined regionally as one of those types is studied using 2D elliptical Fourier outline analysis. Using a principal components analysis, the point types are compared for differences in shape. A complete lack of defining characteristics that would separate the types is described. A history of Archaic Period research is taken into consideration to explain the reasons that these point types were initially separated and not considered the same type. What results is a critical examination of historic practice in the light of the existence of this previously undiscovered technological flintknapping community.

Fox, Jacqueline (Logan Simpson) and Travis Cureton (Logan Simpson)

[79]

Dry Farms and Field Houses: Settlement Archaeology of the Upper Casa Grande Irrigation Communities

Recently completed surveys and excavations on the Florence bajada above the Gila River have documented dry farming fields with an unprecedented level of detail. We used these data to reconstruct the settlement system those fields were part of and found that the organization of production within dry farming fields was similar to that practiced in the irrigated fields. Both field systems were managed out of habitation sites using a system of field houses, but produced different commodities with maize and cotton grown in the irrigated fields and agave grown in the dry farmed fields. We also examined diachronic changes within the dry farming fields and found they were established by the late Pioneer period and saw varying levels of use through the Soho phase of the Classic period, before being completely abandoned by the Civano phase of the Classic period.

Fox, Jon (Fort Lewis College)

[236]

Characterizing Clovis Lithic Technological Organization from Upper Dugout Wash and Other Sites in the Greater Bears Ears Landscape

During the 2019 Fort Lewis College Archaeological Field School previously unknown Paleoindian occupations were documented in southwestern Colorado. These newly identified sites add significantly to a growing body of information about the Late Pleistocene human occupation in the region. The research presented here aims to develop a better understanding of how Clovis-age hunter-gatherers (ca. 13,000 BP) used this landscape. This research uses technological and morphological analyses to characterize the Clovis assemblage from the Upper Dugout Wash site in southwestern Colorado. Comparisons are then made to additional Clovis assemblages at regional curation facilities to assess Clovis lithic technological organization across the Greater Bears Ears Landscape.

Fracchia, Adam [188] see London, Marilyn

Frachetti, Michael (Washington University, St. Louis), Edward Henry (Colorado State University) and Ann Merkle (Washington University, St. Louis)

[48]

Nomadic Cities and Network Modularity: Scalar Analysis in Ancient Urbanism and Social Connectivity

The discovery of small to mid-sized cities (Tashbulak and Tugunbulak) built by the Qarakhanids (ninth–twelfth century CE) at high elevation suggest nomadic khanates may have shaped a model of “modular” urbanism, which we define as a hybridized form of urban centrality and nomadic kinship structure, wherein cities and towns functioned as economic, political, and religious nodes within highly “modular” systems. Unlike better known oasis cities, these high-altitude centers acted as nodes and transfer points for a much larger, dispersed nomadic population (who were not necessarily living in the town/city itself). Modularity here is used to mean that regional power was generated through scalable clusters of connectivity between diverse urban transfer-hubs, where power, wealth etc., helped defined wider communities of participation and enabled network growth without significant population pressure in the towns themselves. As such, the growth or decline of particular centers (within a module) might not change quantitatively the overall functionality of the cluster, unless broader systemic connectivity expanded or collapsed. This paper explores this conceptual turn in understanding Silk Road cities and towns, and illustrates preliminary results on modeling how modular urbanism might have functioned in Medieval Central Asia

Frachetti, Michael (Washington University in St. Louis)

[173]

Discussant

Frachetti, Michael [261] see Merkle, Ann

Franco, Nora (CONICET-UBA), George Brook (University of Georgia), Lucas Vetrano (IMHICHU [CONICET]), Clara Compagno Zoan (University of Buenos Aires) and María Victoria Fiel (University of Buenos Aires)
[198]

The Alice 3 Stone Circle (Upper Santa Cruz River Basin, Argentinian Patagonia): Characteristics and Chronology

Human occupation of the Upper Santa Cruz River Basin dates from ca. 11,200 cal BP to recent, with a hiatus during the Medieval Climate Anomaly (MCA). Re-occupation during the Little Ice Age (LIA) involved a biological change in the population as well as cultural changes. An isolated, open circular structure with concentric rings was discovered on a fluvio-glacial terrace at Alice 3, on the southwestern shore of Lago Argentino. The concentric circles were formed using cobbles from the terrace sediments. So far, no artifacts associated with the circle have been found. Two similar circular structures have been discovered in the middle course of the Santa Cruz River, separated from each other by 100 lineal km. Three test pits within the Alice 1 circle uncovered no material suitable for dating and so an attempt was made to obtain ages using lichenometry and by radiocarbon dating of organic material adhering to the undersides of three cobbles. The radiocarbon and lichenometric age data indicate circle construction near the time Europeans entered the area. This suggests that construction of open-air rock structures was a cultural innovation introduced by new inhabitants during the LIA.

Frank, Jacob [124] see Langlie, BrieAnna

Frank, Michael [185] see Hill, Catherine

Franke, Kristina [59] see Cable, Charlotte

Franklin, Jay, Linda Countryman (EcoPlan Associates), Bruce Phillips (BGP Consulting LLC), John Jones (Archaeological Consulting Service Ltd.) and Jeremy Menzer (University of Arkansas)

[175]

Multidisciplinary Investigations of Prehistoric Dryland Agricultural Systems in Central Arizona: The US60 Silver King to Superior Project

We examine dryland agricultural sites investigated during data recovery of the US60 Silver King to Superior project. Specifically, we address how individual rock alignment and rock pile systems functioned as components of broader dryland farming strategies in the uplands of Queen Creek, Arizona. Water flow in these agricultural systems is modeled in order to assess whether the various features impounded, diverted, or impeded flow, offering insight into landscape modification behavior within the uplands of southern Arizona. Questions of whether rock features functioned for irrigation or soil enrichment purposes are also discussed. Toward a broader interpretation, we use multiple lines of evidence to address function(s), chronology, and relationships among sites. Photogrammetry, GIS, and limited lidar are augmented by pollen and macrobotanical studies, phytolith analysis, ceramic and chronometric data, and architectural variability. We offer some ideas about potential crop yields in regard to associated population counts. We also compare this analysis with other recent work on dryland agricultural research in the area.

Franklin, Jay [36] see Franklin, Lauren

Franklin, Lauren (University of Arizona), Jay Franklin (EcoPlan Associates) and Jean-Philippe Rigaud (Université Bordeaux 1)

[36]

A Closer Look at Gravettian Technological Variation in Dordogne, France

We examine techno-typological attributes of Gravette points and truncated elements from four sites in the Dordogne region of France. These two tool types are often recovered in direct association which bolsters conventional wisdom suggesting truncated elements are merely recycled Gravettes, inadvertently broken during manufacture or use. However, morphological differences between the two suggest truncated elements may be distinct, deliberately produced tools used as different armatures, likely part of a composite hunting technology. We statistically demonstrate that Gravettian lithic technology is effectively far more varied and nuanced than what is presented in either scenario; it is not nearly so simple. Further complicated by temporal and functional diversity, the nature of Gravettian technological variation within the Dordogne is more accurately understood within the specific context of each individual site and/or assemblage.

Franklin, Paris (Willamette Cultural Resources Associates)

[204]

Autoethnography as a Component of Archaeological Research Design

The social dynamics of people involved in archaeological processes are an important aspect of archaeological investigations that are often overlooked. While archaeologists in positions of authority often have an idea of crew relationships and how archaeological researchers interact with other groups (i.e., descendant populations, funders, and surrounding communities) this knowledge is all but forgotten when a project ends. Castañeda argues that creating a record of the sociohistorical interactions of an archaeological project is a valuable and wide ranging addition to the archaeological record (2006; 81). This paper presents the results of formal interviews with a variety of archaeological professionals about whether sociohistorical records can be a useful component in the archaeological record. This study seeks to understand why this method has not become common in archaeological research design

and to determine if archaeologists are willing to incorporate this method into future studies. Also explored is whether or not including social data in the final results of an archaeological project will help future audiences better understand the conditions in which archaeology was conducted. Finally, this paper discusses potential problems with and limitations of including autoethnography in the archaeological record.

Franklin, Stephanie (National Park Service) and Brett Cockrell (National Park Service)

[186]

Saving 700-Year-Old Cliff Dwellings: Fire Archaeology in the Sonoran Desert

One of the biggest issues for the conservation and preservation of archaeological resources is fire. Due to many years of fire suppression throughout the 1900's, the intensity and frequency of wildfires has exponentially increased. This increase in fire and its behavior has caused unique issues for cultural resource managers resulting in adaptive management plans. One aspect of fire archaeology is the practice of wrapping wooden structures to protect them from fire without negatively impacting the structures. Tonto National Monument is known for its two 700 year-old Salado cliff dwellings. Both dwellings have large amounts of original wooden elements and thus make the structures susceptible to fire. In June of 2019 the Woodbury Fire threatened the cultural resources in Tonto National Monument and a decision was made to back-burn the park in advance of the fire. This presented a puzzling question, how to wrap two cliff dwellings in fire resistant material without securing the material directly into 700 year-old wood? This conundrum was solved with an ingenuity, experience, and p-cord. Both cliff dwellings survived the Woodbury fire and this poster describes how this was accomplished.

Fraser, Sharon [120] see Pal Chowdhury, Manasij

Frashuer, Anya (Arizona State University), Christopher Carr (Arizona State University) and Michael Glascock (University of Missouri Research Reactor Center)

[63]

Ceramic Exchange and Community Organization of Middle Woodland Period Hopewell Groups in the Scioto Valley, Ohio

This poster examines ceramic exchange as a proxy for the social interaction aspect of community organization in Middle Woodland Period Hopewell groups living in the Scioto River region of Ohio. The results of instrumental neutron activation analysis (INAA) and electron microprobe analysis (EMA) are discussed as they relate to the interaction and influence expectations of two models proposed: the more constricted dispersed sedentary community model and the fluid regional-use model. The characterization of clay and temper resources that were available to the peoples and potters living in the region was conducted as a first step prior to identification of non-local wares. Ceramic samples from 23 sites across the region dating to the Early to Fort Ancient Periods were subjected to INAA and EMA and the resulting data were analyzed using principle components analysis (PCA) and hierarchical cluster analysis. Once a preliminary characterization was addressed, the ceramics from Middle Woodland contexts were re-assessed using PCA and cluster analysis to identify non-local wares. These potential non-local wares were then compared to the clays and tempers characterized for different areas within the Scioto Region to determine potential provenience. The frequency and scale of exchanged wares were then assessed based on model expectations.

Frederick, Charles

[40]

Latest Pleistocene to Middle Holocene Environmental Change along Terlingua Creek: Geological Context of the Lykes Duncan Site

Detailed analysis of the alluvial deposits at the Genevieve Lykes Duncan site provide insights into the broad arc of paleoenvironmental change from the terminal Pleistocene to the Middle-Late Holocene in the Big Bend region of Texas. The site is situated at the confluence of two streams (Terlingua Creek and Davenport Draw) and has clearly received sediment from both during this period. Examination of the alluvial deposits exposed in the gully where the site was discovered revealed three major depositional units, with the Paleoindian occupation situated within the oldest deposit. Dissection of the deposits within the center of the site forms the basis of the paleoenvironmental interpretation.

Frederick, Charles [269] see Cesaretti, Rudolf

Frederick, Charles [198] see Griffith, Timothy

Frederick, Charles [194] see Lawrence, Ken

Frederick, Katelyn (Texas State University)

[169]

Hips Don't Lie: A Validation Study of the Albanese Metric Sex Estimation Method for the Proximal Femur on a Modern North American Population

Sex estimation is a key component of the biological profile used in skeletal studies for bioarchaeology and forensic anthropology. Albanese (2008) introduced a new method of sex estimation that involves measurements between three newly defined landmarks on the proximal femur that create a triangle, which reflects both the angle of the femoral neck and the concomitant adaptations from the female pelvis. The original study generated logistic regression equations for sex estimation that are not population specific and have achieved a 95–97% allocation accuracy when distinguishing between males and females. In this validation study, Albanese's method was applied to a sample from the Texas State University Donated Skeletal Collection (n = 100) and achieved an 89% allocation accuracy. Of the eleven individuals that were misallocated, eight were female, three were male, and all were aged between 53 and 91 years. An intra-observer error assessment (n = 20) was also conducted from the original sample and reported an average error margin of less than 1%. Considering these results, this method of sex estimation has proven to be exceptionally reliable thus far, and would benefit strongly from other studies to further validate or negate it as a universally applicable approach.

Frederick, Kathryn (Michigan State University) and Susan Kooiman (Southern Illinois University Edwardsville)**[233]***Pits and Pots: The Agency of Women during the Terminal Late Woodland Period of the Upper Great Lakes*

Upper Great Lakes research, to date, shows that in response to a changing environment, a dramatic shift occurs in the socio-economic landscape during the Terminal Late Woodland period (AD 1000–1600). This shift is evidenced by an increase in community size, increasingly restricted territories, demarcation of social boundaries, increased incorporation of cultigens into diet, a focus to fall resources, and a proliferation of food storage. Additional evidence for this socio-economic change is supported by recent analysis of ceramic cooking vessels and subterranean storage containers for the region. This paper argues that changes in Late Woodland subsistence strategies were driven by the decision-making of women. Analysis of subterranean food storage containers (their construction, location, and the food stuffs stored) and ceramic cookware (its construction, use, and contents) supports the argument for a shift in focus to abundant fall resources (including nuts, berries, and wild rice) that could be collected in surplus, with minimal labor costs. The tasks of food collection, processing, and cooking are traditionally accomplished by women, leading to the conclusion that these primary markers of subsistence change were controlled by women. The traditional division of labor, evidenced in ethnographic and ethnohistoric accounts, puts women as the agents of socio-economic change.

Freeman, Andrea (University of Calgary)**[140]***Twenty-Five Years of Geoarchaeological Research on Ancient Shorelines and Channel Margins*

In 1995, Michael Faught and I organized a session for the SAA titled “Paleoshorelines and Channel Margins.” The session brought together people working principally in eastern North America to discuss what we understood about the context of Paleoindian sites and prospects in offshore, near shore, and stream adjacent contexts. Having seen the benefits of decades of studying stratigraphy and chronology in the west, we thought that an examination of context would lead to new discoveries. This paper examines what we have learned in the 25 years since that session. Looking broadly at geoarchaeological research of Paleoindian sites across North America, the last quarter century has seen an expansion of contexts and the information that can be gathered from those contexts (DNA, isotopic data, etc.), as well as the use of more effective mathematical and computer models. While standard stratigraphy and chronology remain foundations for any study, the most profound discoveries have come from the application of laboratory-based methods and new sites are found by breaking old traditions.

Freeman, Andrea (University of Calgary)**[219]***Moderator***[219]***Discussant***Freeman, Jacob (Utah State University), Darcy Bird (Washington State University), Erick Robinson (Utah State University), José Capriles (Penn State University) and Judson Finley (Utah State University)****[26]***Studying the Long-Term Stability of Agricultural Societies to Inform Climate-Smart Agriculture*

Over the next 30 years, food production must increase by 70% to feed nine billion people and, simultaneously, cope with climate change. Thus, multilateral agencies, such as the World Bank, advocate policy shifts to “climate-smart agriculture.” Climate-smart agriculture mitigates ecological degradation, enhances productivity and maintains the robustness of production to climate change. Yet, the relationships between these “triple win” processes are not well understood. Important tradeoffs may exist in complex systems between increases in productivity and the robustness of such systems to change. In this paper, we use radiocarbon records to investigate the relationships among population growth, climate change, and population robustness in six case studies over the last 4,000 years. We find that societies specialized in agriculture experienced more robust populations than societies that engaged in more flexible, mixed foraging and farming. The more specialized agricultural societies also experienced less severe negative changes in population than less specialized societies. However, societies with more engineered landscapes may have experienced starker declines in well-being during periods of decline. Long-term tradeoffs may permeate the engineered landscapes of agricultural societies, and contemporary policy should take such tradeoffs into account in the design of climate-smart agriculture.

Freeman, Jacob [179] see Mauldin, Raymond

Freeman, Jacob [26] see Robinson, Erick

Freeman, Jeremy (Standing Rock Sioux Tribe)**[44]***Discussant***Freidel, David (Washington University, St. Louis)****[93]***Moderator***Freidel, David (Washington University, St. Louis)****[209]***Discussant***Freidel, David (Washington University, St. Louis), Olivia Navarro-Farr (College of Wooster) and Mary Kate Kelly (MARI**

Tulane University)**[223]***El Peru-Waka', a Kaanul Vassal Kingdom in the Era of Dzibanché*

El Peru-Waka' was a strategic royal city in the conflicts between the Kaanul Regime and adversaries in Petén led by the kings of Tikal. In the sixth century, when Dzibanché is documented to be the major capital of the Kaanul kings, Wak dynasty King Chak Tok Ich'aak married a Kaanul Regime woman, Ikoom Sak Wayis, fathered a son, and died two years after raising a stela, plausibly in war. His queen and son raised a stela to him subsequently. This presentation reviews the evidence for Wak dynasty alliance with Kaanul beginning in the sixth century and considers the implications of this projection of power from eastern Quintana Roo to northwestern Petén.

Freidel, David [166] see Rich, Michelle

Freire, Shannon (Marquette University)**[80]***Grave Reckoning: Recovering Connections Between Medical Education and the Archaeological Record*

This research was undertaken to explicate behavioral changes in the archaeological record of the Milwaukee County Poor Farm Cemetery (MCPFC). Analysis of the twice-excavated Cemetery II (1882–1925) documents several types and varieties of postmortem skeletal modification attributed to autopsy and medical dissection. These interments have been associated with the local medical establishment, including medical and dental colleges, through historic documents and recovered material culture. Following a complete reorganization and consolidation of Milwaukee's medical colleges in 1913 into a single school of medicine and a single school of dentistry, Marquette University became the sole institution of medical and dental education in Milwaukee during the final twelve years of Cemetery II's use. This may have coincided with a change in mortuary behavior as recent research has identified a reduction in the complexity of burials in the northeastern section of the cemetery used between 1918 and 1925. Critically, fewer anatomized individuals are represented archaeologically in this section than are documented historically. Marquette University archives were utilized to provide historical data about contemporaneous anatomical teaching practices and the subsequent disposition of remains. Several possibilities to explain the disconnect between archaeological data and historical documentation have emerged and will be presented.

Freiwald, Carolyn (University of Mississippi), Kaedan O'Brien (University of Utah) and Sarah Clayton (University of Wisconsin, Madison)**[133]***Diet and Mobility at Chicoloapan Viejo*

Chicoloapan grew and prospered after the fall of Teotihuacan, but little is known about the people who lived there. We present osteological information for five individuals recovered from a salvage context, along with a reconstruction of their diets and origins placed in a regional context. Strontium, carbon, oxygen, and nitrogen isotope values provide baseline information for the Chicoloapan population from birth to burial and give us a point of departure for future analysis of life in the Valley of Mexico after Teotihuacan.

Freiwald, Carolyn [270] see Alsgaard, Asia
 Freiwald, Carolyn [178] see Friedel, Rebecca
 Freiwald, Carolyn [14] see Wrobel, Gabriel

French, Kirk (Pennsylvania State University)**[152]***Moderator***French, Kirk (Pennsylvania State University)****[181]***Moderator*

French, Lewanne [22] see Fisher, Abigail

Freund, Kyle (Indian River State College), J. M. Adovasio, Allen Quinn and Frank Vento**[222]***Phase I and II Excavations at the Sexton Site (8IR01822), Indian River County, Florida*

The Sexton Site (8IR01822) is situated on a slightly elevated limestone hammock in Indian River County, Florida. Extensive geophysical prospection, shovel probing, and subsequent block excavations revealed the presence of a midden with a possibly contiguous seasonal village or hamlet of probable Woodland age. The site was episodically visited/occupied into the Historic period. The results of the fieldwork are summarized and compared to other previously studied localities in the region, in turn highlighting how the Sexton Site can make an important contribution to understanding the prehistory of south Florida and beyond.

Friberg, Christina (Indiana University, Bloomington), David Massey (Indiana University, Bloomington), Edward Herrmann (Indiana University, Bloomington) and Quinn Lewis (Indiana University, Bloomington)
[175]

New Age Methods, Age Old Questions: lidar Point Clouds for Assessing Mississippian Moundbuilding Labor Investment

Angel Mounds State Historic Site, a Middle Mississippian fortified mound center along the Ohio River, is home to eleven man-made earthworks which make up the largest known archaeological site in Indiana. Angel's occupation coincides with the regional changes in social organization that characterize Mississippian society. Many archaeologists have discussed mound volume as a proxy for complexity, but calculation methods and interpretations are varied and outdated. Increased accessibility to drone-mounted remote sensing technologies has provided archaeologists with unprecedented control over the frequency and spatial resolution of data collection. This trend toward "personal" remote sensing enables the use of noninvasive, cost-effective survey methods in challenging landscapes, and provides more precise and accurate measurements than traditional aerial methods. This paper demonstrates the practicality of drone-mounted sensors for 3D modeling of earthworks at Angel. We calculate the volume of Mound A using models based on drone- and aircraft-fixed Light Detection and Ranging (lidar) and compare the results to assess each strategy's viability in the field. These findings are extrapolated to assess labor investments for the mound's construction and implications for the degree of sociopolitical complexity among Angel's earliest inhabitants. Finally, we discuss the application of these methods for informing site management and preservation efforts.

Friedel, Rebecca (University of Texas, San Antonio), Bernadette Cap (University of Texas, San Antonio), Carolyn Freiwald (University of Mississippi) and Jason Yaeger (University of Texas, San Antonio)
[178]

Paleoethnobotanical Remains from an Early Classic Maya Tomb at Buenavista del Cayo, Belize

In the tropics, paleoethnobotanists often face challenging preservation environments, making most of the macrobotanical specimens that we analyze those that are preserved through processes of carbonization. This preservation issue is often framed as limiting the questions we can ask and the interpretations we can make about ancient Maya relationships with the environment. Occasionally, unusual preservation contexts reveal new and exciting possibilities for understanding ancient human-plant relationships. In 2018, the excavation of an Early Classic Maya tomb at Buenavista del Cayo, Belize, recovered a variety of uniquely preserved, uncarbonized macrobotanical remains, including hundreds of maize kernels that were likely originally part of whole ears buried with the individual. The paleoethnobotanical analysis of the remarkably preserved contents of this tomb allow us to contribute new ideas about the use of plant materials in Maya royal burials. Additionally, the plant remains found with this individual have the potential to shed new light on ancient landraces as well as trade and migration throughout Mesoamerica.

Friedl, Lukas [36] see Ellis, Grace

Frieman, Catherine (Australian National University)
[207]

Discussant

Frieman, Catherine (Australian National University) and James Lewis (Independent researcher)
[234]

Identity and Inheritance: Being Cornish during the Roman Occupation of Britain

With the Roman invasion of Britain in the first centuries AD, we see a major shift in settlement patterns, social practices, and economic structures. Indeed, within a few generations, much of Britain saw a widespread adoption of Roman material culture, cosmology and practices which were blended with pre-existing ideas and ways of life into a uniquely Romano-British hybrid. However, in Cornwall, Roman sites are few and Roman materials and ways of life seem to have been thin on the ground. Instead, to an archaeological eye, it strongly appears that Cornish ways of life remained much as they were in the centuries before the Roman invasion of Britain, right up until the sixth century BC. Settlements comprised circular and oval buildings, often enclosed by circular banks and ditches, local technologies persisted, and no obvious shift in religious practice is visible. In this paper, I will explore the continuity of Cornish identity, economic structure, and landscape organization during the first half of the first millennium BC. I argue that, rather than being a backwards or unchanging way of life, this continuity reflects an ongoing and dynamic engagement with both the past and with the present realities faced by Romano-Cornish people.

Friend, Sadie (Radford University), Emilie Wiedenmeyer (Texas State University) and Ashley McKeown (Texas State University)
[215]

Evaluating the Applicability of the Coimbra Method on an Archaeological Sample from Sint Eustatius

To uncover details of past people's day to day life, bioarchaeologists have attempted to reconstruct possible activity patterns by examining changes that occur at musculoskeletal markers, called enthesal sites (ES). While there is general agreement about the overall effect of confounding variables on entheses, there are discrepancies regarding the degree to which these variables affect enthesal change (EC) and the true association between activity level and EC. The objectives of this study include (1) analyzing the presence and severity of enthesal changes in the upper limbs of individuals excavated from an unmarked, presumably slave cemetery from the eighteenth century on the coastline of Sint Eustatius, (2) evaluating the applicability of the Coimbra Method (Henderson et al. 2013, 2016) to a small archaeological sample, and (3) assessing the possible scoring error of this EC method. This study found that the majority of recorded EC occurred on M. biceps brachii and that males are more likely to exhibit EC. The results of this study also suggest that this method faces challenges in repeatability, archaeological applicability, and inexperienced observer use.

Fries, Eric (UNLV)**[7]***The Desakota as a Model for Understanding Dense Urban-Agrarian Settlement among the Ancient Maya*

Recently, large-scale surveys using lidar and other remote sensing technologies have revealed that Maya urban centers were much larger in both settlement area and number of features than previously thought, while also incorporating various forms of large-scale anthropogenic landscape modification for the purposes of intensive agricultural production. These findings challenge existing models for understanding Maya urbanism. The concept of the “desakota”, used in urban geography to describe densely populated urban/agrarian mixed-use areas in Southeast Asia, can be employed to understand these newly recognized attributes of Maya settlement. Settlement data from the Aguacate region in western Belize is used here to demonstrate the applicability of the desakota model to a Maya case. The pattern in this region consists of widely distributed, patchy settlement with numerous small monumental sites and continuity with the outlying settlement of adjoining larger centers. This pattern may be better explained by the desakota model than by descriptors such as “peri-urban zones”, “hinterland”, or “low-density urbanism,” which have been applied previously.

Fries, Eric (UNLV)**[155]***Discussant***Friese, Crystina (University of New Hampshire), Amy Michael (University of New Hampshire) and Meghan Howey (University of New Hampshire)****[184]***Toward Repatriation and the Creation of an Object Biography: A Multi-factorial Analysis of a Human Finger Bone “Necklace”*

While NAGPRA was passed almost 40 years ago, repatriation work is far from over. Among remaining challenges are items with no provenience that were donated by non-professionals to museums and universities. The University of New Hampshire’s Archaeology Collection retains a “finger bone necklace” from a 1940s/50s collector that is an example of such a challenge. His collection lacks documentation and the little information known is speculative. Recently, UNH undertook an effort to repatriate this item which was identified as a human bone “necklace” at the time of accession in the 1980s. While the object is not of prehistoric manufacture (the proximal ends of the metacarpals and metatarsals are drilled with a mechanical bit), the true origin of the bones is unclear. Multi-factorial analyses (e.g., pXRF, DNA, LA-ICPMS) were undertaken to investigate origin(s) of the individuals, manufacture of the object, and postmortem processes. In this case, repatriation of the artifact is only possible through scientific analysis; indeed, the remains may be of historic, non-Native origin. Targeted study allows for minimally invasive analyses resulting in repatriation or more ethical curation. This research demonstrates that cross-disciplinary experts (e.g., indigenous partners, archaeologists, chemists, museum specialists, bio-forensic anthropologists, etc.) must collaborate in repatriation work.

Fritz, Sherilyn [59] see Bruno, Maria C.

Fruhlinger, Jake (Idaho National Guard)**[52]***Progressive Methods in Building Tribal Relationships*

Building long lasting meaningful relationships with Native American Tribes is key to successful consultation. It is widely known that there are numerous Congressional intentions, as well as Secretarial and Executive Orders stating that public agencies are required to consult with Native American Tribes on issues relating to cultural resources on public lands and/or involving impacts to rights guaranteed by treaty. This presentation discusses ways and some of the tools agencies can use to develop much needed relationships with Native American Tribes and the community as a whole.

[52]*Chair***Fry, Megan (University of Florida), John Krigbaum (University of Florida) and George Kamenov (University of Florida)****[240]***Social Differentiation and Identity in the Anglo-Saxon Kingdom of Lindsey*

Lindsey is a poorly understood Anglo-Saxon Kingdom, which underwent many sociopolitical changes during its tenure. An independent kingdom until AD 620, it experienced both a major religious conversion, as well as five shifts in its ruling elite during the latter part of the seventh century. Although this unstable governance is well documented in the historical record, less is known about how these changes affected its occupants directly. Six sites within the boundaries of Lindsey were surveyed for skeletal markers of nutritional distress as well as determinants of social status. These data were paired with isotopic analyses in 36 individuals, to demonstrate the physiological effects of social instability as they relate to status, age, and sex. Further, spatial and temporal comparisons between Anglo-Saxon Kingdoms allows for broader discussions of inter-settlement relationships and identity.

Fry, Olivia [148] see Patton, Natalie

Frykholm, Soren (Proyecto Arqueológico del Conjunto Monumental de Atzompá), Nelly Robles García (Proyecto Arqueológico del Conjunto Monumental de A) and Dante García (Proyecto Arqueológico del Conjunto Monumental de A)**[145]**

Hallazgos de la excavación de una habitación residencial de la época IIIB/IV de la zona arqueológica de Atzompá, Oaxaca, México
Atzompá, un asentamiento satélite de las élites de la capital zapoteca, alcanzó su apogeo y población máxima durante la Época

IIIB-IV de Monte Albán (500 dC-900 dC). Al igual que en Monte Albán, el sitio parece haber sido abandonado en algún momento al final de esa época. Desde 2007, el PACMA (Proyecto Arqueológico del Conjunto Monumental de Atzompa), dirigida por la Doctora Nelly Robles García, ha estado excavando este sitio arqueológico, que cuenta con varios complejos de edificios alrededor de plazas; un complejo funerario, y dos grandes unidades residenciales ya totalmente excavadas y ahora restauradas. Durante 2019 el PACMA realizó una excavación al lado del Edificio Funerario en el Cuarto 3. Este cuarto está adosado a la fachada norte del Edificio (al extremo Oeste de la fachada norte) y colinda en su muro oeste con la Casa de los Altares. Dado esta ubicación, el cuarto ocupa un lugar bastante central dentro del complejo residencial que lo rodea por los lados norte y oeste, y presentó materiales importantes. Esta ponencia discute la probable función del recinto dentro del complejo Edificio Funerario/Casa de los Altares.

Fuchs, Christopher (Washington College)

[122]

Moral Standing and Site Preservation

Defining a site is where all archaeological work begins, and depends on whether a site is considered active, a location where living people are interacting with their environment, or static, a place fixed in time that no longer changes. Traditionally, archaeologists view sites as static locations appropriate for investigation, including excavation, conservation, and other forms of analysis. However, many descendant communities consider archaeological sites active places still in use and with important functions that continue to the present. All manner of activity, from excavation to conservation and natural degradation, has effects on the archaeological resources present on sites. Reexamining the way sites are determined to be active or static ultimately determines where responsibility for archaeological resources lies, and who bears the duty to respect not only those who left them behind, but their living descendants as well. Ethics surrounding decisions affecting site preservation and moral standing of past and future generations must be carefully considered, in order to improve the archaeological study of these nonrenewable resources.

Fulbright, John [187] see Reid, Amy

Fulkerson, Tiffany (Washington State University) and Shannon Tushingham (Washington State University)

[72]

Making the Data Count: Analyzing Inequities and Challenging Epistemic Injustice in Archaeological Discourse

The recent resurgence of interest in diversity and equity issues in archaeological practice highlights persistent disparities in the demographic composition of practitioners in various aspects of the discipline. Drawing from a database that we generated on the gender and occupational affiliation of 5,010 authors of 2,445 articles in six regional and national publication venues, we demonstrate that men and individuals in academic settings continue to dominate discourses in North American archaeology, particularly in the more prestigious publication venues. We further document considerably higher representations of women and compliance archaeologists in non-peer-reviewed publishing forums. We frame our results within the context of the “leaky pipeline” effect for women, and the cost-benefit realities of publishing for people who occupy different professional sectors of archaeology. Insights into the methodological difficulties of analyzing equity and diversity in the sciences, as well as problems with conventional measurements of “success” in the modern professional era of North American archaeology, are provided. We conclude by offering realistic and nontraditional strategies for reducing epistemic injustice in the contemporary landscape of knowledge dissemination.

Fulkerson, Tiffany (Washington State University)

[91]

Discussant

Fulminante, Francesca (Bristol University), Luce Prignano (Barcelona University, Spain), Sergi Lozano (Barcelona University, Spain; IPHES) and Ignacio Morer (Barcelona University, Spain)

[48]

“All roads lead to Rome” but Where Did They Come From? Analyzing Regional Network Systems in Iron Age Central Italy

What is an ancient city? When does a settlement become a city? Why do some cities prevail and why do they eventually decline? This paper discusses transportation networks to analyze interactions between the cities of central Italy (ca. 1150–500 BC) to offer a novel perspective on this debate. Physical connectivity is essential for the inter-settlement cooperative processes—such as information exchange, trade and defense—that influence the development of past societies and their growing complexity. So far, however transportation routes have not been given sufficient attention with reference to debates around early urbanism. The establishment of terrestrial routes requires a certain level of cooperation. In addition, since their maintenance requires significant resources, they are affected by competing interests. In this way, transportation infrastructure can be regarded as a product of social relations and of the interactions between societies and environment. To better understand emerging Latin and Etruscan polities and the mechanisms underlying their variable success, this paper analyses fluvial and terrestrial communication systems of these two regions by using a novel Network Science approach. The results shed new light on how they emerged and functioned, and also suggest potentially why, in the end Rome prevailed.

Fulton, Deirdre

[51]

Faunal Remains from Medieval San Giuliano Plateau

A large number of faunal remains were uncovered during the four seasons of excavation (2016–2019) at the San Giuliano Plateau (SGP), Italy. The collection consists of species that are typical to inland sites in the northern Mediterranean during the Medieval period, specifically sheep, goat, and pig. As well, birds and cattle supplement the diet. These faunal remains were collected from the

interior of a monumental building that sits on top of SGP as well as stone pits located to the west of the building, dating to the eleventh through mid-thirteenth century CE. The pit excavations brought to light a distinctive distribution of faunal remains, including a large number of partial or complete rats. Based on the lack of gnaw marks on other bones in the pits and the large number of complete rat skeletons found in the pits, it is most likely that the rats were exterminated and then dumped into the pits. The number of rats (MNI) and context in which they are found may indicate the practice of rat venary taking place at SGP.

Fulton, Deirdre [51] see Grimes, Vaughan

Fulton, James [51] see Grimes, Vaughan

Fulton, Kara (University of North Texas)

[140]

The Effect of Social Landscapes on Human Resilience at Actuncan, Belize

Understanding paleo-landscape transformations is inclusive of natural and social landscapes. Paleo-landscapes reflect a dynamic convergence of physical processes and cultural meaning. Social landscapes are influenced by factors such as perceived connections between people, ritual and everyday practices in which people engage together, and spaces where people conduct activities. These factors contribute to the formation and maintenance of shared group identities. The nature of these identities can affect how we approach challenges as well as how successful we are in the face of change. Given this context, this paper discusses the effect of social landscapes on the ability of Classic Maya residents to cope with changing political environments at the settlement of Actuncan, Belize. Social stratum, and likely associated identity, appears to be tied to people's level of resilience to shifting power structures. Understanding how social landscapes affect resilience has implications for how we approach archaeology now and in the future.

Funk, Caroline [59] see West, Catherine F.

Furquim, Laura [161] see Wyatt, Andrew

Gabellone, Francesco (National Research Council, CNR), Maria Chiffi (Techné s.a.s.), Davide Tanasi (IDEX USF, Florida) and Michael Decker (IDEX USF, Florida)

[104]

3D Mosaics: Integrated Technologies for Indirect Documentation, Conservation, and Engagement of the Roman Mosaics of Piazza Armerina (Enna, Italy)

3D digital imaging for the study of archaeology and the global dissemination of knowledge is of growing relevance and has proven to be extremely beneficial in particular on cases characterized by poor digital accessibility. With seven Unesco World Heritage sites, Sicily has an extraordinary heritage perfectly representing the cultural achievements of many Mediterranean civilizations, but yet the digital presence of such heritage is rather limited. The aim of this paper is to present some methodological insights to tackle issues of 3D digitization of mosaic floors via digital photogrammetry on the basis of direct experience with the case study of the Roman Villa del Casale at Piazza Armerina (Enna, Sicily, Italy). The virtualization of over 2,500 m² of mosaic floor was carried out in the frame of an international collaborative project undertaken by University of South Florida's Institute for Digital Exploration—IDEX, in partnership with the Regional Department for Cultural Heritage and Sicilian Identity and specifically with the Regional Hub of Piazza Armerina, Aidone and Enna and the University of Catania.

Gabellone, Francesco [104] see Chiffi, Maria

Gaffney, Chris (University of Bradford), Tom Sparrow (University of Bradford), Alex Corkum (University of Bradford), Helen McCreary (University of Bradford) and Chrys Harris (University of Bradford)

[107]

Prospecting and the Interpretation of Twentieth-Century Sport and Leisure: Events, Sites, and Landscapes

The archaeology of modern sites has become a significant aspect of the work carried out by some prospection groups. While many surveys are to identify events linked to warfare or burials, there is great scope to investigate other elements of the very recent past. In this paper a suite of sites that are linked by local folk memory will be discussed. In comparing and contrasting different sports and leisure events we will also consider topophilia (a sense of identity and regard for a place) in explaining the loss or reinforcement of the local understanding of space. This analysis is strengthened by the narrative of place and heritage that is now part of the increasing value of sporting space that can be understood from both a cultural historical and a geographical perspective. The sites will include a football (soccer) pitch, open-air swimming pool (Lido) and an industrial Exhibition held in 1904. The recent nature of the sites challenge the way in which geophysical data is used to engage the public with their past, as well as providing unusual and inherently digital ways to data for heritage management purposes.

Gaffney, Isabella (University of York), Helen Grant (University of Lancaster), Logan Kistler (Smithsonian), Jane Thomas-Oates (University of York) and Oliver Craig (University of York)

[229]

Can Isotope Ratio Mass Spectrometry Be Used to Demonstrate Drought Stress in Archaeological Maize?

The cultivation of maize (*Zea mays* L.) has occurred for nearly 10,000 years and it has recently become the most produced crop

globally. Many desiccated samples of maize were discovered preserved in Tularosa Cave in New Mexico which was occupied by a Native American culture for 1000 years. Palaeoclimate data show the region underwent periods of drought during the cave's occupation. The aim of this study was to test whether $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ values from cellulose and bulk $\delta^{15}\text{N}$ data demonstrate a response to drought conditions, and to determine if Tularosa maize can serve as an indicator of historic agricultural conditions. Modern maize (drought resistant and drought susceptible varieties) was grown under three experimental conditions (well-watered, drought, and severe drought). The $\delta^{15}\text{N}$ was measured in bulk samples of maize ears and $\delta^{13}\text{C}$ was measured in cellulose extracted from bulk tissues. Results show a depletion of the ^{13}C isotope in cellulose from maize grown under drought stress when compared with well-watered samples. Bulk nitrogen isotope ratio results demonstrated a trend of increasing $\delta^{15}\text{N}$ with increasing drought stress. Archaeological maize samples from Tularosa cave were similarly analysed. The archaeological samples showed a trend of strikingly increased $\delta^{15}\text{N}$ with warmer growing conditions.

Gaffney, Vincent (University of Bradford)

[238]

Discussant

Gaggioli, Amanda

[234]

Assemblages and Socio-Natural Forces of Infrastructure: The Case of Reservoirs in the Iron Age (ca. 1200–300 BCE) of South India

The development, organization, and control of water infrastructure in India has caused increasingly complex social issues in modern times. Current debates view water use and management from modernist perspectives and assume a nature-culture divide where human agents act on a passive natural background. Through the case of Iron Age water reservoir features in South India, I complicate modernist views of traditional water management by analyzing Iron Age reservoirs as human-nonhuman assemblages. I treat culture and nature as combined terms and consider the actions of both humans and nature, such as agricultural and pastoral practices, soil, geological topography, vegetation, animals, water, rain patterns, and climate, in the formation of what I designate as the Iron Age South India reservoir assemblage. Furthermore, I discuss the consequences which these assemblages had on social and environmental conditions. The persistence of Iron Age reservoir assemblages occurred alongside an increasing entanglement and entrainment of socio-natural forces. Humans became entrapped in long-term investments of labor, which resulted in altered forms of ritual practice and differentials in political power. This study reveals that reservoirs are not features resulting strictly from socio-cultural decisions and interventions but are rather assemblages of socio-natural forces.

Gagnon, Celeste [174] see Sutter, Richard

Gagnon, Celeste [169] see Torres Morales, Genesis

Galaty, Michael L. [263] see Baci, Erina

Galindo, Mary (Galindo Environmental Consulting)

[113]

Discussant

Gallaga, Emiliano (EAHNM) and Manuel Reynaldo Parra (EAHNM, Chihuahua)

[101]

Ceramics from a Presidio: Preliminary Results from Presidio San Carlos, Chihuahua

On the summer of 2018, a total archaeological collection survey was made at the remains of the Presidio of San Carlos, near the community of Manuel Benavides. Here we will present preliminary results on the ceramic analysis. The results include ceramic distribution patterns in the area, forms and possible uses and activities of daily life revealed by the collected sherds, as well as a proposal on the possibilities of this material as a marker of social status of those who occupied the presidio during this period of occupation at the end of the eighteenth century.

[101]

Chair

Gallagher, Martin (University of North Texas)

[51]

Road Survey in the Environs of San Giuliano

This paper discusses the evidence for Etruscan and Roman roads in the territory of San Giuliano, and evolving strategies for control of the surrounding landscape. Road survey conducted as part of the San Giuliano Archaeological Project (SGARP) has problematized prevailing conceptions derived from literary sources and more limited archaeological knowledge about the ancient political organization of Southern Etruria. Rock-cut Etruscan roads connected the site to key centers on the Tyrrhennian coast and in the Tiber Valley, as well as to an important transcontinental route to the North. The identification of defensive works along these roadways, designed to protect San Giuliano, suggest its independence until the late-fifth century BC. Likewise, connections with intermediate sites reveal the importance of its immediate region, situated between the sea and the Tiber Valley within the modern prefecture of Viterbo. A late fifth-century road directly connected the major coastal site of Cerveteri to San Giuliano, and was partially re-utilized by the Roman Via Clodia in the third century BC. Combined with materially attested trade connections, and data

from the new excavations at San Giuliano, studying the features of Etruscan and Roman roads can improve our understanding of political and economic history in South Etruria.

Gallareta Cervera, Tomás (Kenyon College)

[57]

Documenting the Brigades: Oral History of Local Archaeology Experts in the Puuc Region, Yucatán, Mexico

Oral history is a method that contributes to the decolonization of contemporary social sciences. This is particularly important for Maya archaeology where even though local communities are largely disconnected from their ancient past, Maya populations are linked with their ancestral land and rural lifeways at the periphery of larger urban centers. In 2018 we started recollecting oral histories from local Yucatán groups of agriculturalist-turned site custodians known as the Brigada Volante, and of agriculturalist-turned ancient masonry experts known as the Brigada de Restauración. Through their vast knowledge of the archaeological landscape, use of local language, and ease of communication with the local population they are recognized as local custodians and experts of the archaeological ruins. In this paper we discuss the preliminary results of our project "Voices Of The Puuc Angels: Rural Life Among The Archaeological Ruins In The Yucatán Peninsula," which, through video ethnography and multi-site interviews, documented the different narratives that people from the Puuc Region in Yucatán, México, have about rural lifeways in Yucatán and their relationship to the archaeological past.

[57]

Chair

Gallareta Negrón, Tomás [230] see Ringle, William

Galle, Jillian (Digital Archaeological Archive of Comparative Slavery) and Fraser Neiman (Thomas Jefferson Foundation)

[98]

Can Stylistic Elements Variation on Mass-Produced Ceramics Help Us Understand How Enslaved People Acquired Ceramics?

In 2000, inspired by Stephen Plog's landmark work on stylistic variation on ceramics, the Digital Archaeological Archive of Comparative Slavery (www.daacs.org) began recording individual stylistic elements on mass-produced refined ceramics recovered from domestic sites of enslavement across North American and the Caribbean. In this paper we explore what the resulting data can tell us about variation in modes of ceramic acquisition among enslaved households on a single plantation and across plantations. We start with the assumption that at any given time, design and production processes at the factory determine stylistic element frequencies for a specific vessel type, defined by the intersection of ceramic ware, vessel shape, and decorative technology. If that is right, then stylistic element variation among assemblages that cannot be accounted for in terms of type variation may be sensitive to variation in the networks, connecting factory to household, in which the ceramics were acquired. For enslaved people in the eighteenth and nineteenth centuries, these networks included cash-purchases from stores and peddlers, trade and barter with other people, and gift or thefts from owners. We empirically evaluate this idea and its implications for the organization of these networks and for inferring how enslaved households acquired ceramics.

Gallegos Gomora, Miriam Judith (Centro INAH Tabasco) and Ricardo Armijo Torres (Centro INAH Tabasco)

[126]

The Figurines: Evidence of Trade, Rituals, and Identities among the Peoples of the Gulf of Mexico Coast

Across 700 km of coastline, from southern Veracruz to the northern Yucatán Peninsula, the populations of many cities of the Late Classic period made use of figurines, small and fragile objects of fired clay that mainly represented women, men and animals to scale. In many cases, these objects were also musical instruments. Investigation of the style and context of the figurines indicates that several cities shared the use of the same type of representation, while others only appear in each place. Female figurines, for example, are unique to each city, suggesting that they portrayed the ideal of the local woman with her characteristic attire, and thus were a reflection of the social identity of each place. On the other hand, Instrumental Neutron Activation analysis –INAA– performed by Ronald L. Bishop on a sample of figurines in the region, confirmed the existence of producer and consumer sites of these objects. In this paper, we will discuss the existence of a route of exchange of goods and ritual practices along the coast of the Gulf of Mexico, based on the results obtained by INAA and the studies of style and context of figurines located in sites belonging to this route.

Gallivan, Martin (William & Mary) and Jessica Jenkins (University of Florida)

[251]

Deep History, Colonial Encounters, and Revitalization in the Algonquian Chesapeake

This paper explores the idea that the Powhatan paramount chief's relocation to the town of Werowocomoco represented an act of revitalization intended to renew the power of a ceremonial place. Studies of revitalization movements often trace a historical process of social stress, cultural distortion, and reformulation of cultural patterns through revival or reaffirmation of selected features. The archaeological record of Werowocomoco, the capital of the Powhatan chiefdom when colonists arrived in the Chesapeake, aligns with elements of these models. Prior to the colonial era, two phases of earthwork construction at Werowocomoco mark the town as a place of ceremony, followed by significant population decline at the settlement during the sixteenth century. European colonists periodically visited the Chesapeake and established a missionary outpost near Werowocomoco during this period, likely introducing deadly diseases into the region. Also during this century, paramount chief Wahunsenacawh moved his residence to Werowocomoco—a town that may no longer have had any resident population—as he consolidated control over a regional polity. Seeing Werowocomoco as the center place of a revitalization movement offers a new way of reconnecting Virginia Algonquians' deep history and the events of the colonial encounter.

[251]

Chair

Galloway, Tori (Indiana University), Tamara Thomsen (Wisconsin Historical Society), Caitlin Zant (Wisconsin Historical Society) and Victoria Kiefer (Wisconsin Historical Society)

[192]

Scow Schooners around the World: An Archaeological Analysis of Scow Schooners and Their Surrounding Maritime Heritage

Scow schooners were vital to many small communities around Lake Michigan, connecting them with regional markets through the lakeshoring trade. Despite its proliferation, or perhaps as a result of it, it is difficult to trace the scow's introduction to the New World. While conventional scow schooners appeared on the Great Lakes as early as 1820, the wide range in design and sparse archaeological record for this vessel type makes classification difficult. Other North American regions, such as the Atlantic Coast, Gulf Coast, and San Francisco Bay, mirrored the scow's expansion on the Great Lakes. The scow expanded all the way to the Pacific Islands, and if imitation is the highest form of flattery, much can be said by the fact that New Zealand scows were descendants of those of the Great Lakes. In an effort to better understand the design of scow schooners on a global scale, an archaeological analysis of vessel features and a historical understanding of maritime heritage regarding these vessels serves to contribute toward an ongoing comparative analysis of this regional variation of scow schooners.

Galvan, Dagmar and Emily Engan

[186]

Role of a Fire Archaeologist

In this poster, we discuss the role of a fire-qualified archaeologist during a wildland fire. The beginning process, fieldwork, technology, and outcomes are described. Emphasis is put on building relationships with the fuels and fire department of the Forest Service to implement protection measures.

Galván Benítez, Miguel Ángel

[145]

El sistema de desagües del Juego de Pelota de Monte Albán

La recolección y almacenamiento de agua pluvial es una de las prácticas más antiguas en Mesoamérica. La investigación arqueológica en diversos sitios ha permitido la identificación y documentación de depósitos subterráneos, depósitos a cielo abierto, almacenamiento en recipientes y más común el sistema de desagües. En Monte Albán los estudios sobre el aprovechamiento del agua de lluvias no ha sido extenso, sin embargo, el "Proyecto Emergente de Restauración por los efectos de los sismos del 7, 19 y 23 de septiembre del 2017 de la Zona Arqueológica de Monte Albán: El Juego de Pelota" ha permitido identificar, estudiar y restaurar el sistema de desagües del Juego de Pelota. En la presente ponencia se exponen valiosos datos sobre la captación, distribución y usos de las aguas pluviales en la parte noreste de la plaza principal, dando cuenta de cómo la planeación urbanística de Monte Albán se enfocó por una parte, en resolver el problema del abastecimiento de agua y por el otro, evitar las posibles inundaciones de los espacios públicos.

Gamache, Joel [165] see Graham, Carole

Gama-Vooz, Marisol (Gama-Vooz)

[101]

Across the Rio Grande: The Aerial Ore Tramway, a Case of Industrial Archaeology in the Big Bend Region

In the 1900s a group of adventurous entrepreneurs resumed mining activities that had been abandoned a decade prior in the Big Bend region. The idea this time was to utilize new mining technologies. Overcoming long distances, rugged terrain, international, and cultural borders, an expensive and new mineral transport system known as an aerial tramway which spanned six miles across the U.S./Mexico Border was installed. The installation of the aerial tramway and its towers and cables became central to the developmental boom in the Rio Grande/Rio Bravo region. It brought a decade of transformations to the landscape including the mobilization of a new workforce, new communities, economic investment, and the bridging of the Sierra del Carmen of Mexico with the Terminal Valley of the United States. However, only a few years after the second life of mining in the Big Bend region, it fell into oblivion again. Today the wobbly towers of the aerial tramway stand in what is now Big Bend National Park as a reminder of the industrial landscape that once thrived in this strikingly tough region.

Gamble, Lynn [72] see Herr, Sarah

Garbellano, John Michael

[56]

Changing Tides and Terrain: Dr. Mary Butler's Hudson Valley Archaeological Survey

Consistent demonstration of patience and fortitude are several characteristics of the most revered pioneers in human history. These qualities were seen in many individuals blazing new paths for others to follow. Directly or indirectly, those who created these paths helped improve the overall state of humanity in the Americas. Knowingly or unknowingly, Dr. Mary Butler was an agent of change in the discipline of anthropology. And she is worthy of the veneration that many great pioneers have received. This paper focuses on the life and career of Dr. Butler and, more specifically, her archaeological survey of the Hudson Valley in New York. Her seminal project was underrepresented and misrepresented by colleagues of her time, but by no means, forgotten. Dr. Mary Butler is an icon of many firsts for women in anthropology. Her work has influenced the careers of many and has the potential to continue to do so for years to come.

Garber, James [239] see Bentley, Heath

García, Dante (Zona Arqueologica de Monte Albán), Nelly Robles García (INAH Oaxaca) and Axel Andrade Perez [145]

Nuevos elementos en la iconografía zapoteca: Un friso en el tablero noreste de Casa Sur en el sitio arqueológico de Atzompa
En los sistemas de escritura precolombina de Mesoamérica, la zapoteca tiene un lugar especial en la diversidad de estudios realizados en la búsqueda por descifrar estelas, pintura mural y vasijas cerámicas que han permitido conocer importantes informaciones sobre las élites político-sociales, sus alianzas matrimoniales, rituales funerarios, culto y veneración a los ancestros, así como las genealogías de diferentes ciudades del clásico tardío y postclásico temprano (650–1250 d.C.). En esta ponencia se presentan los recientes descubrimientos y aportes sobre los sistemas de lectoescritura zapoteca ya que en las temporadas 2018–2019 del “Proyecto Arqueológico del Conjunto Monumental de Atzompa” se descubrió un friso con bajorrelieves que decoran un tablero tipo doble escapulario en la fachada principal de la residencia conocida como Casa Sur. Este tablero único en su tipo, presenta una narrativa gráfico (sintagma)- lingüística (discursivo), que conserva el sistema pictográfico zapoteco, por lo cual, se presenta aquí el hallazgo, los métodos empleados de registro y documentación arqueológica, así como una propuesta de lectura semiótica contextual que permiten dar cuenta de la función de este recinto e importancia del mismo en la consolidación del poder que mantuvo la élite político-social de este barrio de Monte Albán.

[145]
Chair

García, Dante [145] see Frykholm, Soren

Garcia, Lorena [161] see Silva, Fabiola

García Atiénzar , Gabriel [25] see Coltofean-Arizancu, Laura

García-Casco, Antonio [246] see Weber, Marion

Garcia-Herreros, Jorge and Jasmin Moxham [202]

Search for the Cannons “The Twin Sisters”

The cannons known as “The Twin Sisters” were among the principal weapons used in the Battle of San Jacinto. After their crucial role in this battle they became symbols of the victory of Texas over Mexico. During the Civil War, the cannons again saw service in the Battle of Galveston. After the Civil War, the cannons disappeared. A story circulated that Dr. Henry North Graves had buried the cannons in Harrisburg in order to prevent the Union from taking them. Since then multiple attempts have been made to find these cannons. In 2011, a non-profit group was created to perform a comprehensive search for the famous cannons. This search was based on a newly developed hypothesis as to the location of the cannons. To locate areas of interest, a cesium vapor magnetometer survey was conducted. The gathered data was processed to delineate the cannons and other buried artifacts. This paper describes the search that was conducted for the cannons and its findings.

Garcia-Putnam, Alex (University of Wyoming) and Maria Smith (University of Syracuse) [119]

The Biocultural Consequences of Forced Labor at the Obraje de San Marcos de Chincheros, Ayacucho, Peru.

From a bioarchaeological study of indigenous laborers in Colonial highland Peru, we test the hypothesis that the mechanical stresses associated with long-term forced textile manufacturing is patterned. We investigate this embodiment of forced labor through analyses of human remains from the cemetery at the Obraje de San Marcos de Chincheros (ODC) (~AD 1570–1823), a textile workshop town. Spanish policies regarding resource extraction and labor exploitation would have been firmly in place by this time, and we hypothesize that their effects were embodied in the bones and tissues of those buried in the cemetery (Klaus et al. 2009; Mumford 2012; Salas de Coloma 1998). Following standard osteological data collection practices (Buikstra and Ubelaker 1994; Ortner 2019), we explore the demography and evidence for pathological conditions present in the skeletal sample from ODC. We expect an elevated frequency and severity of degenerative joint disease in the upper limbs, especially in females, due to their increased involvement in the textile industry (Graubart 2000; Klaus et al. 2009). Coupling the historical record, which is rich with descriptions of labor and life at ODC with our osteological analysis, allows this research to go beyond description and speak more fully to the embodiment of forced labor.

Garcia-Putnam, Alex [239] see Smith, Maria

Gardner, A. Dudley (Western Wyoming College) [235]

A Look at the Formative in Northwestern Colorado: Similarities and Differences in the Cultural Assemblages within the Fremont in the Colorado River Drainage Basin

Recent excavations in Northwest Colorado are indicating that between 1100 BP and 800 BP some Fremont Structures in northwestern Colorado contained elements similar to sites found throughout the upper Colorado Plateau. Adobe rimmed hearths, use of grass and cedar in roof construction, and the use of rock slab coverings on roofs are evident in northwest Colorado and

elsewhere. The question is why and to what degree does the northwestern Colorado Formative Period assemblages differ from elsewhere? For instance, there seems to be a lack of beans and squash in the macro-floral record south of the White River in northwestern Colorado. Yet granaries and other structures, are similar to those found through-out the upper Colorado Plateau. In this presentation we will compare and contrast what we have found in excavation and surveys to the cultural assemblages exhibited elsewhere. We will then provide a brief explanation for what appears to be a divergence from established Fremont cultural attributes in northwest Colorado.

Gardner, William (Yale University), Brent Buenger (Western Archaeological Services) and Ja Burentogtokh (Yale University)

[62]

Hunters vs. Herders: A Comparative Analysis of Material Distributions in Hunter-Gatherer and Mobile Pastoralists' Dwelling Space
In the classical work "Man Makes Himself," V. Gordon Childe comments that mobile pastoralists were unlikely to produce a notable archaeological signature due to their use of nonpermanent structures constructed from perishable materials. This mentality gave rise to a long-lasting assumption that mobile pastoralist's households were virtually undetectable in the archaeological record. Recent application of excavation techniques and analytical methods borrowed from hunter-gatherer archaeology have proven, however, that meaningful archaeological evidence of mobile pastoralist nonpermanent residences can be ascertained. That said, the study of mobile pastoralist dwellings is still in its infancy and in need of refinement. Specifically, we question if the use of excavation procedures and analytical techniques developed for the study of hunter-gatherer dwelling space is appropriate for the study of mobile pastoralist dwellings. To address this we compare the distribution of cultural material found in a mobile pastoralist dwelling located in the forest-steppe region of Mongolia to that of Archaic period hunter-gatherer dwellings in the Green River Basin of Wyoming. This exercise will assess if generalized descriptions of cultural material distributions from hunter-gatherer habitations provide useful models for the study of mobile pastoralist nonpermanent dwellings.

Gardner-O'Kearny, William (Portland State University)

[147]

DSift: An Automated Data Exploration Software Package for Matlab

This poster presents an overview of DSift, a new statistical software package. DSift imports data from a user's spreadsheet and automatically calculates a suite of standard exploratory statistical measures and comparative tests. Normality, power, sample size, and effect size statistics are also calculated. Bootstrap confidence intervals can be requested for descriptive measurements. Results are compiled in formatted tables. A variety of descriptive graphs are also produced. Input data can be in a list of measurements or artifact counts. If the dataset consists of measurement data, the user has the option of having DSift convert it to count data and performing the statistical suite on the revised dataset. The user can specify a nominal variable (i.e., excavation unit, site, component, etc.) for finer grained analysis. Data can be further subdivided and analyzed based a second grouping variable (component by site for example). While most statistical software packages can calculate exploratory measurements, DSift has the advantage of automating the processes as much as possible. DSift was originally constructed in the Matlab programming environment and will be freely available from the Matlab Central file exchange site. Ports are planned for R and Python.

Gardullo, Paul [273] see Lubkemann, Stephen

Garnett, Heather

[79]

Shell, Abandonment, and the Jornada Mogollon

This poster examines the role shell plays in ritual abandonment in the Pueblos of the American Southwest. Ethnographic evidence in the American Southwest suggests that shells held important powers useful for the players and other activities that would have accompanied the ceremonial activities of site closure. I explore the life histories of shell materials in abandonment contexts across the ancient pueblo world and then consider a case study of Cottonwood Spring Pueblo (LA 175). This is a multicomponent site located on the western slopes of the San Andres Mountains of southern New Mexico. The site possesses four El Paso Phase (AD 1300–1450) pueblos. To date excavations in two of these villages reveal evidence of ritual closure that includes burning of the roofs and the addition of various artifacts, including shell, to the burned layers and fill above them.

Garnett, Justin (University of Kansas)

[69]

Basketmaker II Atlatls as Combat Weapons: An Experimental Approach

While the bow and its role in combat are well understood, the atlatl is not so well characterized. The shift from atlatl to bow systems would have effects on many domains of life, from food procurement to combat dynamics. While the role of atlatls in hunting is becoming better understood through a resurgence in public interest in their use, the combat dynamics of atlatls are still relatively unexplored. This research seeks to inform meaningful discussion regarding atlatls as weapons in human combat. This talk will cover experiments in which replica atlatls and darts of the Basketmaker II period (an atlatl utilizing sociotechnical complex of the American Southwest, ~4000–2000 BP) were utilized in simple but realistic mock combat by individuals dressed in personal protective equipment. This research will offer insights and help inform a discussion related to the technological transition from atlatl to bow.

Garnica, Marlen and Eugenia Robinson (Tulane University)

[60]

New Interpretations of La Casa de las Golondrinas: Landscape, Archaeology and Themes of the Art

The rockshelter and rock art site La Casa de las Golondrinas in Guatemala is situated in a volcanic landscape with striking geomorphic similarity to the setting of rock art sites in the American Southwest. A review of motifs document gendered naturalistic, supernatural and cosmological themes with clear references to water, birth, creation, and transformation. Some of the naturalistic images are near duplicates of images found in the American Southwest. Some images are Mesoamerican deities but others seem to be mythological entities unknown in the elite Mesoamerican corpus. An archaeological cache of organic materials preserved in the dry rockshelter is devoted to rain and cycles of time. La Casa de las Golondrinas was a large and important location for rock paintings for at least 3,000 years but glyphs used in the Late Postclassic period (AD 1200–1524) politicized the site when Kaqchikel people conquered the area in their efforts to expand their realm.

Garong, Ame [188] see Monaghan, John

Garrett, Zenobie (University of Oklahoma)

[95]

Discussant

Garrison, Ervan

[238]

Seismic Facies, or How Geophysics Help Shape Submerged Prehistoric Studies on the OCS

Seismic facies are a well-known and well-used interpretative output of the interpretation of geophysical data. The term indicates its source—acoustical or seismic geophysics. The “facies” concept is a geological methodology for the classification of sedimentary lithologies. The use of seismic facies represents an effort to create a methodological analogue in order to correlate geophysical data with the geology where these data were obtained. Early efforts to characterize submerged landforms for potential prehistoric cultural resources used this methodology to interpret shallow geophysical data taken by subbottom profilers and similar devices. This paper will examine the efficacy of this approach and how it helps shape the search and characterization of submerged prehistoric cultural resources on the Outer Continental Shelf (OCS).

Garrison, Ervan [18] see Hale, Nathan

Garrison, Thomas (Ithaca College), Dennis Baldwin (Ithaca College), Rafael Cambranes (Universidad de San Carlos) and Anna Bishop (UCLA)

[206]

Lab Error, Looting, and Lidar: Ground-Truthing and Regional Chronology at El Zotz, Guatemala

The wealth of new settlement and environmental data provided by large-scale lidar surveys requires new field methodologies that maximize the value of the technology while also recognizing its limits. Data from the 2016 Pacunam lidar Initiative (PLI) around the Classic kingdom of El Zotz, Guatemala cover a range of microenvironments, distinguished by their geophysical characteristics and associated vegetative patterns. The accuracy of lab identification of cultural features in the data—such as structures, quarries, and reservoirs—was shown to be highly variable in environmentally-dependent contexts during ground-truthing campaigns in 2018 and 2019. This paper explores patterns in lab classification errors, and what their implications are for explaining broader settlement trends in lidar data. Additionally, this study presents field and lab methods for collecting, processing, and visualizing regional chronological data as a part of ground-truthing efforts as a first attempt to establish more accurate regional chronologies in the face of thousands of new cultural features revealed by lidar surveys.

Garvey, Alana

[243]

An Analysis of Rock Art in Eastern Ancash, Peru

This study presents an analysis of pictographs from the archaeological site of Ushcugaga, located within the highlands of eastern Ancash, Peru. Although the existence of rock art at this site—as well as others nearby—has been established, previous recording has often been partial, with prior analyses focused on other features of the sites. Based on visual analyses including comparisons of the pictographs’ content and style with other iconography from archaeological imagery across Peru, it is proposed that the rock art at Ushcugaga was created over a long span of time, beginning in the second millennium BC and lasting until approximately 1200 AD.

Garvey, Raven (University of Michigan)

[139]

Discussant

Garvey, Raven (University of Michigan)

[171]

Unacceptable Risk: Why Patagonians Didn’t Farm

Patagonia is one of relatively few world regions beyond the Arctic/Subarctic where farming never took root. This is intriguing because, at least in the north, Patagonians lived alongside and interacted with farmers for at least 2,000 years. Nevertheless, we seldom ask why Patagonians didn’t farm, perhaps because of the region’s reputation as an arid, windswept wasteland: environmental severity seems explanation enough. Alternatively, considering Patagonia’s sparse archaeological record, we might reason that, possible or not, agriculture was simply unnecessary because populations remained small throughout the Holocene,

never reaching a point at which farming would have been worth the effort. In this paper, I demonstrate that, in fact, parts of the region are amenable to dryland farming and that foraging efficiency was declining in late prehistory. Neither too-costly farming nor too-beneficial foraging is sufficient to explain the commitment to hunting and gathering. I argue, further, that foraging and farming require very different risk-management strategies, and that farming risks at the time of potential transition in Patagonia were simply unacceptable despite the potential benefits of farming.

Garvin, Arianna (University of California, San Diego), Matthew Sitek (University of California, San Diego), Jade d'Alpoim Guedes (University of California, San Diego), Julianna Santillan Goode (University of California, San Diego) and Paul Goldstein (University of California, San Diego)

[267]

Archaeobotanical Findings from the Tiwanaku Site of Cerro San Antonio, Locumba Valley, Perú

I present the results of an archaeobotanical analysis of samples excavated from multiple household units at the large Tiwanaku residential site of Cerro San Antonio, Locumba, Peru. The Tiwanaku civilization (ca. AD 500–1100) originated in the Bolivian altiplano of the south-central Andes, and expanded into arid lowland regions like the Locumba Valley in southern Perú. Andean rivers flowing west toward the Peruvian coastal region create productive oases in the western valleys that are suitable for growing lowland crops that cannot be grown in the Tiwanaku core region. An exchange model and a settler diaspora model are considered to explain the Tiwanaku presence in the Locumba Valley. An exchange model might argue that Locumba Valley residents and Tiwanaku people maintained contact via existing llama caravan trade routes, while a settler diaspora model suggests that Tiwanaku people colonized the Locumba Valley and preserved their highland identities. Preliminary findings suggest a low count of maize but a high frequency of kiwicha, a highland cultivar. The presence of highland cultivars in the Locumba Valley presents an opportunity to explore Tiwanaku core-periphery exchange, the maintenance of highland identity, and the local climate of the Middle Horizon Locumba Valley.

Garvin, Arianna [61] see Santillan Goode, Julianna

Garzon-Oechsle, Andres [257] see Martinez, Valentina

Gasco, Janine (CSU-Dominguez Hills)

[237]

Hector Neff's Contributions to Research on Late Postclassic and Colonial Soconusco Ceramics

My archaeological research on Postclassic and Spanish Colonial Soconusco has been conducted using a variety of theoretical and methodological approaches, all of which were intended to keep it real, although conclusions were sometimes tentative or speculative. Hector's work has been inspirational because, as Sachiko notes in the session abstract, it always involves using strong empirical evidence to test hypotheses. Over the past 14 years, I have relied heavily on Hector's assistance and his advice as I have turned to compositional analysis for Late Postclassic and Colonial ceramics in an effort to better understand what empirical evidence can tell us about patterns of ceramic production and exchange. From our first collaborative project in 2006 that used LA-ICP-MS, to subsequent projects using NAA, for which Hector gave me sound advice, the results of these studies have advanced our understanding of ceramic production and exchange in Late Postclassic and Colonial Soconusco.

Gassaway, Linn (USFS Lassen National Forest)

[117]

Discussant

Gates St-Pierre, Christian (Université de Montréal), Jean-Christophe Ouellet (Université de Montréal) and Claude Chapdelaine (Université de Montréal)

[12]

To Live in a Longhouse: A Case Study from Iroquoian Village Sites in Southern Quebec

Archaeologists have been largely interested in documenting the architecture, variability, evolution, and even the symbolism of Iroquoian longhouses for several decades in the Northeast, often using the village or the region as the preferred scale of analysis. However, the study of daily life inside these longhouses has not received the same attention, for example as regard to the organization of labour or the emergence of inequalities, among other social dimensions. This presentation will adopt a different, smaller scale of analysis to address these issues through a series of inter- and intra-longhouse comparisons from Late Woodland Iroquoian village sites located in St-Anicet, southern Quebec.

Gauthier, Nicolas (University of Arizona)

[95]

Discussant

Gavériaux, Fanny (Sapienza University of Rome), Laura Motta (Kelsey Museum of Archaeology, University of Michigan) and Laura Sadori (Sapienza University of Rome)

[234]

Urbanization, Intensification, and Stable Isotope Analysis: Discriminating Agricultural Practices and Climatic Instability in Central Italy during the Early First Millennium BCE

The climatic instability that occurred during the late Holocene could have influenced the socio-economic processes which led to the emergence of the first urban centers in Central Italy. From the ninth–fourth centuries BCE, rapid social changes, that have been associated with increasing political and economic complexity, demographic growth, intensified agriculture, and a significant shift in settlement patterns, dramatically restructured life across the peninsula. However, the specific character of some of these processes, in particular changes in farming practices and intensification of production has been difficult to explore thus far due to the lack of direct data. In addition, the relation between agricultural systems, anthropic impact on the landscape and environmental instability is problematic to disentangle due to the low chronological resolution of climatic studies. This project investigates the relations between the use of vegetal resources, agricultural practices, and climatic variations during the eighth to sixth centuries BCE through carbon and nitrogen stable isotope analysis ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$) on carbonized cereals and woods remains. Recent excavations at three proto-urban centers along the Tyrrhenian coast (Gabi, Tarquinia and Rome) offer a unique opportunity for archaeobotanical sampling. Preliminary results on emmer, barley, and oak wood retrieved from securely dated contexts will be presented.

Gay, Brandon (UC San Diego)

[95]

Discussant

Gay, Brandon (UC San Diego) and Paul Goldstein (UC San Diego)

[260]

Walls, Hilltops, and Defense: Exploring Fortification at the Late Intermediate Period Site of Cinto Alto (C8) in Locumba, Peru
The Late Intermediate Period (LIP) (AD 1000–1400) is commonly regarded as a period of factionalism and violence following the decline of Middle Horizon regional polities, such as the Tiwanaku. The present study interrogates these characterizations and asks whether conflict shaped site formation at the LIP site of Cinto Alto (C8) in Locumba, Peru. Extensive surface survey, aerial imagery, and surface collections completed by the Proyecto Arqueológico de Locumba (PAL) between 2015 and 2019 suggest that Cinto Alto's walls and moats leave much of the site without protection. This differs from classic interpretation of heavily fortified hilltop settlements seen elsewhere in Peru. This paper proposes two hypotheses to explain this pattern: that walls at C8 were meant to physically divide the community, or the walls were defensive structures of some nature. The paper summarizes recent 2019 research at Cinto Alto to be further explored in upcoming dissertation research.

Gaylord, Donald (Washington and Lee University) and Eric Herrera (Washington and Lee University)

[119]

The First Alamo: The Remains of the San Francisco Solano Mission Complex

The Gateway Mission and Presidio complex located in present day Guerrero, Coah., Mexico represented the northernmost outpost of the Camino Real before the Spanish settled Texas. The complex consisted of three missions: San Juan Bautista (January, 1700), San Francisco Solano (March, 1700), and San Bernardo (1702). Together with the Presidio del Rio Grande (1703), they became known as “The Gateway of Spanish Texas.” San Juan Bautista and San Bernardo operated for over a century before being secularized, and the Presidio became the city hall used today. San Francisco Solano however, was razed after only 14 years. It was later re-established under the name San Antonio de Valero, better known as the Alamo, currently a World Heritage Site. While the history of the other two missions and the presidio are well-known, San Francisco Solano remains obscure. The location of the mission was forgotten, and its documentation was removed to other archives. This study is the first to locate the mission and translate its documents into English. We will illuminate details the site and its Spanish and Indigenous residents during its short but impactful existence, which will serve as the foundation for a UNESCO Emergency Funding request for historic site preservation.

Gayo, Eugenia (Center for Climate and Resilience Research (CR)2), Manuel Rojas, Marcela Sepulveda (Universidad de Tarapacá) and Antonio Maldonado (Centro de Estudios Avanzados en Zonas Áridas)

[74]

Gathering, Processing, and Use of Plant Resources during the Archaic in the Atacama Desert Highlands: The Case of the “Alero El Bajo” Site

The Atacama Desert highlands (>2,000 masl) have provided key information for the understanding of cultural dynamics of Andean populations that inhabited continuously the South-Central Andes since the latest Pleistocene. Our knowledge about cultural patterns for the Archaic period is, however, constrained by the preservation of materials (i.e plant remains) beyond the record of lithic artifacts, zooarchaeological vestiges or rock art. Actually, settlement patterns and/or features for archaeological Archaic sites have been traditionally inferred from these kinds of evidences. To overcome such limitations, we developed methodological frameworks to recover plant remains in Archaic sites at the upper Azapa basin (18°30'S, >3,000 masl). Practically all of the 105 archaeological sites identified in the upper Azapa basin lack macro-botanical remains. Exceptionally, in the cave “Alero El Bajo” –located alongside an ephemeral canyon– we recovered in excavation over 1,500 excellent well-preserved plant remains. Our results show evidence for the use of local species such as *Cumulopuntia* spp and selective gathering of *Chenopodium* spp. These finding offer the unique opportunity to reconstruct practices regarding the acquisition, management, use/consumption of plant resources throughout the Archaic, and certainly complement our notion about life strategies for hunter-gatherers from the South-Central Andes.

[74]

Chair

Gayo, Eugenia [171] see McRostie, Virginia

Gayo, Eugenia [74] see Ugalde, Paula

Gazis, Michalis [196] see Proulx, Benoit

Ge, Wei [45] see Zhai, Shaodong

Gearty, Erin (Carlsbad Caverns National Park) and Julie McGilvray (Guadalupe Mountains National Park)

[165]

Exploring the Designed Landscape within Carlsbad Cavern: Lidar Mapping of the Historic Cave Trail System at Carlsbad Caverns National Park

Carlsbad Caverns National Park is completing a Cultural Landscapes Inventory and associated National Register of Historic Places nomination for the primary tourist walkways within Carlsbad Cavern. This project includes an inventory and analysis of all associated cultural features and early design strategies within the cave, impacts to and relationships with cave natural systems, and significant viewsheds along the developed infrastructure within the cave. The Center for Advanced Spatial Technologies from the University of Arkansas used lidar to complete 3D surveying and digital mapping of 3.5 miles of paved trails within Carlsbad Cavern. The process of gathering and processing the data resulted in unique challenges that are not typically experienced above-ground, and will be invaluable to future 3D mapping projects in challenging environments, such as those with a cave. The lidar is being used as an analysis tool to explore the complex interaction of the built historic infrastructure with the natural cave environment. The possible applications of the lidar data, however, are wide and varied. They include strategies to increase public awareness, knowledge, support, and access to the cave, methods to make important management decisions within the cave, and instruments that can help balance public access with resource protection.

Geib, Phil (University of Nebraska, Lincoln)

[69]

Basketmaker Atlatl Duels as Ritual Conflict: Interpreting Ancient Rock Imagery

Skeletal remains document violent conflict during the Basketmaker II period of the American Southwest. There is evidence for this on both an individual and intergroup level. The latter is documented by massacre assemblages that represent one end of a continuum in lethal social interaction. Atlatls and darts were some of the weapons used in such encounters, with dart-sized projectiles found embedded in or between skeletal elements. Basketmaker rock imagery further documents violence using atlatls and darts. Analysis of the imagery suggests contexts that seem interpretable as atlatl duels, an activity that perhaps provided a means of conflict resolution to prevent the upscaling of social tensions.

Geiger, Elspeth (University of Michigan) and Emma Creamer (University of Michigan)

[119]

Fur, Seed, and Need: New Subsistence Data from an Early Historic Occupation on Drummond Island

Located on Drummond Island in Michigan, the Cloudman site is a multicomponent site including important "protohistoric" (AD 1400–1650) and Early Historic Anishinaabe occupations (Post AD 1650). Recent research on these occupations has revealed a more complicated depositional history than was previously thought. New faunal and macrobotanical data from the most recent excavations will be shared with the aim to further the discussion of these time periods and the social interactions taking place. This poster will present data from the 2019 field season and will discuss future directions for the analysis.

Gelliot, Eric [189] see Costa, Philippe

Gemberling, Bailey (Bloomsburg University)

[7]

Living under the Canopy: Using Lidar and Archaeology to Reconstruct the Settlement History of a Classic Maya Kingdom

Until recently, conceptions of lowland Classic Maya landscapes were hampered by the difficulty of navigating the dense jungles of Central America. Recent lidar surveys in Belize and Guatemala have finally overcome these limitations and have provided first time images of entire regions of the lowland landscape. El Perú-Waka', a Classic Maya (250–900 CE) city in western Petén, Guatemala, is one of these locations. By combining the spatial data gathered from lidar ground-truthing, and ceramic data obtained from an extensive test pitting program, this poster will present the settlement history of the ancient city and hinterlands. This allows for comparison of the occupational trajectories of periphery settlements and the urban core of El Perú-Waka'. It also informs the spatial variation in local and regional ceramic traditions.

General, Zachariah [252] see Powell, Evelyn

Gentil, Bianca (Pennsylvania State University)

[133]

Defining the Context of the Epiclassic: Measuring Population and Settlement Dynamics in the Puebla-Tlaxcala Valley, Mexico

Shared characteristics between settlements create the archaeological classification of the 'Epiclassic' in Central Mexico. These characteristics include: rise in militarism, an increase in long-distance networks, the upswing in regional centers vying for power, and a boost in art, architecture, and stylistic composition. Puebla-Tlaxcala experienced these changes that spread across Central Mexico during the Epiclassic. The material culture throughout the landscape becomes more localized and heterogeneous—especially since the Puebla-Tlaxcala valley provides intersecting paths of trade between the Basin, Gulf, Mixtec, and Maya regions. García Cook's survey data has been used to analyze settlement distribution in the region, which leads to a narrative of population pressure competing for power, influence, and resources—as depicted in the scene in Cacaxtla. Though conflict was likely present, recent surveys show that assumed population density is not exactly accounted for in most of Puebla-Tlaxcala. Epiclassic

concentrations center between the settlements of Cholula and Cacaxtla and some occupation at the site of Tepeticpac and at the site of La Loma de Santa Margarita in the north end of the valley. This shortage of population density may help us understand the lack of known occupation in the region during the following Early Postclassic period.

George, Amy (Tulane University) and Gabrielle Vail (UNC Chapel Hill)

[138]

Representing Place in Mesoamerican Postclassic and Early Colonial Period Sources

Postclassic indigenous scribes represented place iconographically, by toponyms, or some combination thereof, according to a quadripartite structure of the world in which moving through space was synonymous with moving through time. The world quarters were aligned with specific colors, deities, and sometimes items from the natural world, such as trees and other plants. The central space was delineated as the place of origin and of ritual action, and was often marked by a structure (i.e., a house, temple, or altar). With the introduction of European cartographic traditions in the early colonial period, indigenous scribes continued to map space according to human relationships to the landscape, churches replacing temples as the nexus of communities. Community origin was marked by representations of rulers or founders tied to specific geographic places, such as caves, and prehispanic conventions (toponyms, footprints ideographically marking roads) occurred alongside European ones (e.g., a stylized sun marking the east or a church as an ideograph for a community). This presentation uses sixteenth century maps, such as the *Relación Geográfica* map of Teozacoalco (1580), to explore how communities understood—and repositioned—themselves within the colonial landscape, creating representations of space that were as syncretic as the communities they mapped.

George, Miranda (University of Calgary), Elizabeth Paris (University of Calgary) and Roberto López Bravo (UNICACH)

[150]

Size and Morphology of Canid Skeletal Remains from Moxviquil, Chiapas, Mexico

The site of Moxviquil is located in the Jovel Valley of highland Chiapas, and contains a funerary cave from which human and faunal osteological remains have been recovered. The site's occupation spans the Late Classic (AD 600–900) to Early Postclassic (AD 900–1250) periods. Approximately one-third of the remains belong to the species *Canis familiaris*, represented primarily by dental elements. Canid teeth were used to identify the presence of both small coated dogs, or Techichi, and medium-sized hairless Xoloitzcuintli dogs, an ancient breed that was common to both Aztec and Maya cultures. Many of the canid teeth in this assemblage presented unique morphological features that are diagnostic of the Xoloitzcuintli. Measurements were taken on the height, breadth, and width of the crown (where possible) on all *Canis familiaris* teeth from the assemblage, and compared to specimens from complete canid crania in order to determine the average body size of each individual in the sample. The results were used to interpret the size and breed of the dogs represented in the sample. Maxillary first molar morphologies were used to identify both normal and abnormal cusp patterns suggesting that both Techichi and Xoloitzcuintli dogs were present at the site.

George, Nicole (University of Nevada, Reno)

[195]

Raw Material Selection among Concave Base Projectile Point Makers in Hawksy Walksy Valley

Ongoing research at Hawksy Walksy Valley has uncovered one of the largest assemblages of obsidian concave base points in the northeastern Great Basin. The chronological relationship between this technology and other terminal Pleistocene/early Holocene artifact types (e.g., fluted points) remains an ongoing debate. This relationship may represent sequential late Pleistocene technologies, coeval technologies used by different populations, or different components within the same tool kit. To explore the latter possibility, we geochemically sourced the concave base points from Hawksy Walksy Valley and collected source provenance data on fluted points in adjacent areas. We compared the data to determine if there were significantly different toolstone conveyance patterns, with the expectation that there should be no difference if concave base and fluted points were part of the same tool kit. The results of this study contribute to our understanding of how raw material availability factored into patterns of land use and the possible relationship between concave base and fluted point technologies in the northeastern Great Basin.

George, Nicole [195] see Sturtz, Sara

George, Richard (Pennsylvania State University), Douglas Kennett (University of California, Santa Barbara), Stanley Serafin (University of South Wales, Sydney) and Brendan Culleton (Pennsylvania State University)

[237]

Strontium Isotopic Evidence Reveals High Levels of In-Migration during the Formation, Apogee, and Decline of the Postclassic City of Mayapán

The ancient capital of Mayapán was the final highly nucleated urban settlement in the northern Yucatán during the twelfth–fifteenth centuries prior to Spanish contact. However, the extent of the migration structure remains unknown. After the disintegration of Terminal Classic regional centers, Mayapán emerged as the dominant polity and economic entity in the Maya region. It is believed that the city was established by ethno-political rivals and served as the regional seat of governance and commerce, connecting confederated towns and territories across the Yucatán until its abandonment in the context of warfare, civil conflicts and factional competition. Increased urban development during the twelfth and thirteenth centuries indicate that people were drawn to the fortified cityscape from communities across peninsular Yucatán, and as far as central Mexico and Honduras. We examined the process of urbanization using strontium isotope ratios from human enamel (N=58) to explore the population structure. Although we did not identify migrants from outside the Maya lowlands, the results suggest regional immigration remained a key component of the population structure. These findings suggest that the urban composition of the population consisted of a high percentage of first-generation immigrants, and they demonstrate the cosmopolitan nature of this important Postclassic-period center.

Gerard-Little, Perri [184] see Wescott, Konnie

Gerrard, Richard [228] see Patton, Katherine

Getz, Sara [80] see Simmons, Wilson

Ghezzi, Ivan

[174]

Chankillo as a Fortification and Post-Chavin Warfare in Casma, Peru

Chankillo is a large ceremonial center in the Casma valley, northern coast of Peru, built in 250 BC to worship the Sun. It contains, besides the earliest astronomical observatory known to date in the Americas, an impressive hilltop fort. Previously, the dominant view on the function of this building was as a setting for ritual battles. However, research aimed at evaluating whether it is really a fortification revealed evidence for its attack, destruction, forced abandonment, and burial. The hilltop building was a Fortified Temple, built to protect the sacred space and symbols of the site, not the population at large, from religious wars fought to destroy rival huacas. Many aspects of this fortification, especially the violent desecration of its temple, suggest socially distant fighting parties of a different religious ideology, not the complementary groups expected in ritual tinku battles. Rather than competition over scarce resources in a circumscribed environment, the breakdown of social relationships and the emergence of rival ideologies after the collapse of Chavin civilization seem to have been the driving forces behind the onset of warfare in the post-Chavin world.

Giardina, Miguel [15] see Morgan, Christopher

Giardina, Miguel [243] see Neme, Gustavo

Gibbs, Anna (Baylor University)

[51]

A Study of Medieval Intrasite Find Distribution on the San Giuliano Plateau

The San Giuliano Archaeological Research Project (SGARP) excavates a site in Lazio, Italy known as San Giuliano, which has an occupation history spanning from the Bronze Age to the medieval period. The project aims to understand the long-term transitions and habitation patterns of the societies that occupied the region. The medieval component of the San Giuliano site is a local manifestation of the widespread, but still poorly understood "incastellamento" process (the relocation of large parts of the medieval Italian population into defensible, fortified sites between AD 700 and 1200). My paper presents a GIS analysis of artifact location and attributes within the medieval fortification excavation atop the San Giuliano plateau. I employ ArcGIS to run statistical analyses of artifact distribution patterns and their associated features within the medieval castle zone. These analyses reveal artifact densities and patterning related to site use and refuse deposition across the site. The interrelationship of finds and archaeological features reveal key transitions in the use of space atop the fortified plateau. GIS analysis of the finds ultimately provides an integrated view of the spatial and social dynamics of an Italian castle, and contributes to our understanding the wider process of incastellamento.

Gibbs, Hannah (University College London)

[231]

Changes in Interaction with the Local Environment: Historical, National, and International Influence in Belize

This research seeks to ascertain the extent to which an archaeological site can be implicated in changes for the local community. Based on interviews, observation, and participatory mapping exercises conducted in San Jose Succotz, Belize, in May and June 2019, and follow up fieldwork in the UK, this project investigates if there are changes in the way people can interact with the local environment, and examines different perspectives on what causes these changes. San Jose Succotz is a Maya village situated across the river Xunantunich, an Ancient Maya site which includes the second tallest structure in Belize. The research documents the interaction of individuals and the local population with the environment now and in comparison to the recent past. The project aims to see if there are specific areas or locations where changes in access to the local environment have affected the community. The study presents three topics implicated in the local changes; historical change, national change, and international change, and provides insight into how the changes manifest in the daily lives of the village's population. The project explores a detailed perspective on the global issues of environmental degradation and globalization, interconnected with the presence of the archaeological site, Xunantunich.

Gil, Adolfo [15] see Morgan, Christopher

Gil, Adolfo [243] see Neme, Gustavo

Giles, Bretton (Kansas State University)

[166]

Mississippian Cosmos as Artificial Memory Systems

This presentation examines the characteristics of Mississippian cosmological schema and how they correspond to the construction of artificial memory systems. I point out that the Classical 'art of memory' involves the construction of (spatialized) memory loci that are populated with striking and unusual images. As Frances Yates notes, these memory loci can be either real or imaginary places, but they need to be sequentially arranged so that they can be visited in order and one can move either backward or forward from each locus. These memory spaces are often colloquially referred to as 'memory palaces,' but other spatial configurations can be

memorized. For instance, some medieval and renaissance scholars employed the spheres of the universe or places in paradise and hell as artificial memory systems. In this vein, I contend that the structure of Southeastern and Plains Native American cosmos fit these characteristics of artificial memory systems because they are organized into stacked layers. They are also populated with striking and unusual images (e.g., heroes, gods and composite monsters), which were associated with particular layers. I therefore argue the portrayal of Mississippian cosmological imagery could have materialized an artificial memory system, employed to remember important social prescribed information.

[166]

Chair

Gillam, J. Christopher (Winthrop University), Nicolas Zwyns (UC-Davis), Masami Izuho (Tokyo Metropolitan University), Biambaa Gunchinsuren (Institute of Archaeology, Mongolia) and Brent Woodfill (Winthrop University)

[175]

Falconing the Paleolithic: High-Resolution Aerial Mapping of Northern Mongolian Paleolithic Landscapes

In recent years, pedestrian surveys of the Tolbor River and neighboring tributaries of the Selenge River Basin in northern Mongolia have yielded 95 Upper Paleolithic open-air sites, with excavations at six of these sites documenting the 45,000 years of human occupation in the region. Beginning in 2011, ongoing efforts to discover and characterize the greater Paleolithic landscape began with GPS-mapping of new and previously documented sites and GIS database development with base layers developed from Shuttle Radar Topography Mission (SRTM) 30 m and 90 m resolution Digital Elevation Models (DEMs). In 2019, the first attempt at high-resolution aerial drone mapping of select excavated sites was a boundless success that will lead to a greater understanding of the cultural landscapes, complex geomorphology and site formation processes of the region's mountain forest-steppe environment.

Gillaspie, Amy (Community College of Denver; History Colorado) and Gene Wheaton (Community College of Denver)

[231]

Denver's Early History: Uncovering Colorado History at the Wootton Site

The Wootton Site is located in Denver, Colorado, on the present-day Auraria Campus, which is home to University of Colorado Denver, Metropolitan State University of Denver, and Community College of Denver (CCD). Denver was long the home to indigenous populations prior to the settlement of miners in 1858. The Wootton family was the second white family to settle in the town of Auraria, directly adjacent to and on the Southwest side of Denver. It was here that "Uncle Dick" Wootton established two buildings at the site, a general store and a saloon. The Rocky Mountain News, the first newspaper in Denver, was first published from the second story of the general store in April 1859. And it was next door at the saloon and bowling alley that a convention to form the State Government of Colorado met, also in April of 1859. A flood eradicated these buildings and many others in 1864, and rebuilding efforts never occurred. This talk will report findings from the first field season (August to December 2019) and will discuss the historic importance of the site, including the field school Dr. Wheaton leads at CCD.

Gillispie, Thomas (University of Alaska Museum of the North), Charles Holmes (University of Alaska, Fairbanks), Ben Potter (University of Alaska, Fairbanks), Angela Younie (Far Western Anthropological Research Group) and Evelynnn Majere (Healy Lake Tribal Council)

[82]

Late Glacial Age Crescentic Bifaces from East-Central Beringia

New paleogeographic data regarding Late Glacial retraction of the Cordilleran and Laurentide ice sheets has clarified debate about potential routes and timing for human migration into the Americas. These studies allow for terminal Pleistocene dispersal from Northeast Asia via both Pacific Rim (PR) and interior Beringia-Canadian (IFC) routes. Previously, crescentic bifaces found with stemmed projectile points on California coastal islands have been interpreted as an indicator for an exclusively PR migration. Here we report on crescents found with Eastern Beringian Tradition assemblages. These were excavated at stratified sites in east-central Alaska, with an age range circa 13,100-11,200 calBP, as determined by over fifteen radiocarbon dates. Associated artifacts include triangular and indent base projectile points, but stemmed points are absent. In contrast, the range for radiocarbon dated crescents from California and the Western United States is circa 12,580-8,000 calBP. Based on the radiocarbon chronology, Beringian crescents may antedate California island crescents by up to 1,000 years and the earliest examples from Paleoindian or Western Stemmed sites by circa 300 years. The northern IFC discoveries therefore demonstrate that crescentic bifaces currently provide no support for an exclusive PR migration.

Gillot, Celine (University of Montreal, Canada)

[20]

Quarrying Stone, Carving Knowledge: Landscape Familiarity, Raw Materials Selectivity, and Extraction Technology at Río Bec (Campeche, Mexico)

Scars left on the bedrock, open-pit quarries and piles of waste stone are all part of the cultural landscape surrounding many buildings raised in ancient Maya archaeological sites. This "stonescape," now barely visible, is more than just the physical setting in which people lived and performed their daily activities. It is also a key place to investigate how these people, their natural environment and resources, as well as their technical skills and knowledge were mutually engaged with, and embedded within, each other. This paper explores this dynamic interplay in the process of quarrying stone. Using geoarchaeological data collected through a study of extraction sites found around and beneath the buildings of Río Bec, I will discuss several issues regarding the familiarity of Río Bec's inhabitants with their karst landscape, the preferential selection of specific limestone outcrops, the variability of the materials available, and the different methods employed to extract them. Such issues were critical for the people engaged in quarrying activities. They offer an alternative avenue for approaching these activities not only through the quarry and stone workers' lens, but also through the skills and knowledge involved.

[20]

Chair

Gillreath-Brown, Andrew (Washington State University), Kyle Bocinsky (Crow Canyon Archaeological Center) and Tim Kohler (Washington State University)

[125]

Food Risk and Maize Production: Experiments in Combining Low-Frequency and High-Frequency Temperature Signals in the Southwestern United States

The timing and rate at which dryland maize farming spread and intensified throughout the southwestern United States was highly variable. Although maize first appears around 2260–1990 BC in Arizona and New Mexico, maize dependence does not increase substantially to the north (e.g., southeastern Utah) until the Basketmaker II period (ca. 500 BC–AD 500). Moreover, maize farming does not intensify in southwestern Colorado until around AD 600. The timing of the spread of maize into southern Utah and Colorado is likely linked to genetic traits that allowed maize to adapt to temperate zone temperatures and growing seasons. Thus, temperature has likely had a major impact on maize expansion. In this paper, we try to better understand the impacts of climate, particularly temperature, on past crop production in the southwestern United States. Past researchers have attempted to consider the low-frequency temperature signal along with the high-frequency temperature and precipitation signals. We reconstruct low-frequency temperature using pollen data and the Modern Analog Technique, which can then be combined with high-frequency reconstructions from tree rings using wavelet modulation. We discuss our progress and how our preliminary results change views on the role of production shortfalls in major transitions in Ancestral Pueblo prehistory.

Gilmore, Eric [148] see Patton, Natalie

Gilmore, Kevin (HDR), Jonathan Hedlund (ERO Resources Corporation) and Bonnie Clark (University of Denver, Department of Anthropology)

[6]

Through a Glass, Darkly: Shedding Light on Late Prehistoric Obsidian Conveyance and Apachean Ethnogenesis on the Plains. Obsidian was technologically and symbolically important to the prehistoric inhabitants of western North America, and analysis of the assemblage of obsidian from the Bayou Gulch site (5DA265) in Colorado suggests both uses were important to the site's Late Prehistoric Period inhabitants. Chemical analysis identified New Mexico, Idaho, and Colorado sources, and the symbolic importance of obsidian is suggested by the presence of a small unmodified obsidian nodule. These data from Bayou Gulch fit a pattern of changes in obsidian quantity and source area over time on the Plains. Sometime after ca. AD 1000, there is a ten-fold increase of material conveyed from northwestern sources (Idaho and Wyoming) to the Plains which could be associated with the arrival of proto-Apache Promontory culture groups in the eastern Great Basin and the Western Plains ca. AD 1200. Strong social ties among these kin groups supported exchange networks to the west and south. After ca. AD 1450 material from northwestern sources becomes scarce, and this decrease could correspond to the in-migration of Numic groups, resulting in decreased access to northwestern sources and the attenuation of contact between geographically separated groups of Apacheans, ultimately leading to ethnogenesis of the modern Eastern and Western Apachean branches.

Gilmore, Kevin [78] see Slaughter, Michelle

Gilstrap, William (Massachusetts Institute of Technology)

[196]

Pottery Technology and Cultural Transfer along Anatolia's Great Caravan Route

Excavations at the site of Kanlıgeçit in Eastern Thrace revealed material remains of Early Bronze (EB) III (ca. 2350–2250) reminiscent of contemporary and slightly earlier sites in western and central Anatolia. The presence of monumental architecture similar to Troy II coincides with the first appearance of wheelmade pottery—Anatolian Red-Slipped tankards and depas cups—suggest strong eastern influence. These pottery forms were followed by wheelmade plainwares and shapes such as high-necked jars that first arrived in Cilicia from the south before being transferred along trade routes to central Anatolian sites like Külliöba. Strong Anatolian traits, particularly wheelmade pottery, indicate to some that EB III Kanlıgeçit was an Anatolian colony. Others consider it a product of cultural and technological diffusion assisted through expansion of existing trade routes from Syro-Cilicia across central Anatolia. This phenomenon is similar to that observed in the EB II Aegean in which Anatolian architectural features and drinking sets (e.g., the Lefkandi I–Kastri group) become widespread. This paper examines production technology of both Red-slipped and plainware from contemporary phases at Kanlıgeçit and Külliöba, offering insight into Kanlıgeçit potters adoption of the wheel and providing insight into the nature of this cultural shift.

Gilstrap, William [39] see Crawford, Dawn

Gingerich, Joseph (Ohio University), Timothy Cleland (Smithsonian Museum Conservation Institute), Gwenaëlle Kavich (Smithsonian Museum Conservation Institute), Linda Scott Cummings (PaleoResearch Institute) and William Childress (Archaeological Society of Virginia)

[180]

Is That Really Late Pleistocene Blood? A Case Study from the Clovis Assemblages at Smith Mountain, VA

Many recent studies have been published that report the recovery of proteins and residues on stone tools. This avenue of research could provide important insights about hunter-gatherer activities. The most common type of analysis has been detection blood residue. Because many immunological approaches to detect blood residue have been called into question, we suggest a multi-faceted approach to protein residue studies. Here, we present a case study on a late Pleistocene artifact from Smith Mountain,

Virginia, USA. This study discusses the results of immunological analyses, FTIR, mass spectrometry, and SEM analyses on a ca. 13,000-year-old Clovis point from eastern North America.

Giomi, Evan (University of Arizona) and Barbara Mills (University of Arizona)

[26]

Evaluating Social Boundaries in Coalescent and Colonial Societies through Network Analysis: Social Transformation on the Rio Grande between AD 1300 and 1700

Archaeologists recognize globally that one of the primary consequences of coalescence and colonialism is increasing social complexity. This takes the form of more heterogeneous social formations, as well as more multilayered interactions at a regional scale. Archaeologists increasingly evaluate these interactions as complex systems emerging from a network of relationships between individual settlements, rather than as interaction between and within regions and subregions. In the U.S. Southwest, coalescence and colonialism particularly contributed to increasing social complexity after AD 1300 and network analysis has previously proven useful in analyzing the complex systems of regional interaction that resulted from this greater social complexity. This project makes use of the cyberSW database of ceramics to extend network analysis to the eastern Pueblo area. One consequence of increasing social complexity is the transformation of social boundaries, sometimes hardening and sometimes softening distinctions between groups. This project uses network methods to characterize boundaries between social groups by looking at the degree of embeddedness of sub-areas within the larger regional system. Change in the nature of these boundaries is evaluated over time, in the period from AD 1300 to AD 1700.

Giovas, Christina [271] see Fitzpatrick, Scott

Giraldo, Santiago (Global Heritage Fund and Fundación ProSierra)

[246]

Discussant

Giulia, Ricci (1. Post-Doc, UMR 7041, ArScAn-AnTET, Université Paris Nanterre, Paris, France), Val Aurore (Abteilung für Ältere Urgeschichte und Quartärökolo) and Porraz Guillaume (CNRS, UMR 7269, Laboratoire méditerranéen de préhi)

[11]

The Technological Sequence of Heuningneskrans (Limpopo, South Africa) around the Time of the Last Glacial Maximum

The southern African region comprises a mosaic of biomes influenced by various physical and atmospheric parameters. Pleistocene hunter-gatherer societies would have exploited those biomes differently, which would have contributed to generate different lithic assemblages and traditions. The opposition between the coast and the veld is often regarded as one main dialectic that contributes to explain the technological variability across the landscape. Other oppositions have also been proposed, relating for instance to the distribution of raw materials. In this paper, we focus on a recently excavated lithic assemblage from Heuningneskrans in Limpopo Province (South Africa) and initiate a discussion on the Robberg techno-typological expressions in South Africa with regard to (1) space (inland and coast), (2) time (around the Last Glacial Maximum) and (3) geo-resources distribution (raw materials).

Glascock, Michael D. (University of Missouri) and Rodrigo Loyola (Universite Paris Ouest Nanterre La Defense)

[237]

Once Upon a Time: Obsidian Circulation during the Early Peopling of the Atacama Desert

Early humans to South America encountered wide diversity of ecosystems, including the Atacama Desert. Due to its extreme aridity, the Atacama Desert is generally considered a marginal cultural area inhabited by a handful of scattered hunter-gatherer groups. Very little is known about the level of contact between groups living in the Atacama and the neighboring area of northwest Argentina. To investigate the extent of interaction networks of hunter-gatherer groups in the region, an obsidian artifact investigation was conducted. Several hundred artifacts from archaeological sites occupied during the Early Archaic (13,000–11,000 BP), Middle Archaic (11,000–5500 BP), Late Archaic (5500–4500 BP), and Early Formative (3500–2500 BP) periods were analyzed by X-ray fluorescence (XRF), and a subset of undetermined artifacts were studied by neutron activation analysis (NAA). A combination of local and long-distance sources were identified, as well as several currently unknown sources. Temporal differences in source usage indicate that interaction networks expanded over time. The evidence supports that hunter-gather groups maintained long-distance contacts with one another as a key strategy for survival in one of the most extreme environments on earth.

Glascock, Michael [133] see Andrews, Bradford

Glascock, Michael [39] see Breault, Sarah

Glascock, Michael [150] see Crider, Destiny

Glascock, Michael [63] see Frashuer, Anya

Glascock, Michael [267] see Hester, Thomas

Glascock, Michael [196] see Iñáñez, Javier

Glascock, Michael [5] see MacDonald, Brandi

Glover, Jeffrey (Georgia State University) and Dominique Rissolo (University of California, San Diego)

[33]

Assessing Terrestrial and Aquatic Trade Routes in the Maya Area: A View from the Yucatán's North Coast

This paper provides an overview of the development and reconfiguration of precolumbian trade routes in the Maya area from the Preclassic to the Postclassic periods. During this long expanse of time, the Maya took advantage of overland, riverine, and coastal

trade routes to varying degrees. The political turmoil that occurred in the southern Maya lowlands during the late eighth and ninth centuries AD, often referred to as the "Collapse", led to the disintegration of existing trade routes and created new opportunities for the expansion of coastal trade. The emphasis on these coastal trade routes is evidenced in a multitude of ways in the archaeological record, most famously in the murals found in the Temple of the Warriors at Chichen Itza and in the material culture of this influential center. We investigate the archaeological evidence of this dramatic shift from the perspective of the archaeological project we direct, the Proyecto Costa Escondida, which investigates the lives of precolumbian Maya inhabitants along the Yucatán Peninsula's north coast.

Glover, Jeffrey [271] see Bryant, Jeff

Glover, Lauren [28] see Allard, Francis

Glowacki, Donna [149] see Hovezak, Tim

Glumac, Bosiljka (Smith College), Carlos Peraza Lope (Centro INAH, Yucatán, Mérida), Marilyn Masson (University at Albany) and Bradley Russell (College of St. Rose, Albany, NY)
[20]

Geoarchaeological Perspectives on Ground Stone Sources of Precolumbian Maya Household Architecture and Assemblages in Northwest Yucatán, Mexico

Limestone and its weathering products, as the only abundant stone resources in flat karst lowlands of northwest Yucatán, were extensively utilized by inhabitants of this region during the Terminal Classic and Postclassic Periods in the general vicinity of the archaeological site of Mayapán. For architectural use, coarse coquina limestone was readily available for dwelling and houselot walls. Coquina was often selected for grinding and abrading tools and disc-shaped beehive lids. Fine-grained calcarenite limestone was carved into sculptures and was selected for finer grinding or polishing implements. Less common was piedra dura or well-indurated muddy limestone found as subrounded pseudoclasts in extensively weathered limestone (sascab), excavated from shallow pits (sascaberas), and calcrete or caliche crust offered naturally flat surfaces for certain implements. This paper reviews limestone tool source diversity over time at a large sample of residential groups of varying social status; most types of ground stone were available locally, given diversity evident within the same or nearby outcrops.

Gnivecki, Perry L. [59] see Beamer, Dawn

Godard, Robert [203] see Cannon, Molly

Godhardt, Ava (Western Colorado University), Lauri Thompson (Center for Archaeological and Tropical Studies), Julie Saul (Programme for Belize Archaeological Project) and David Hyde (Western Colorado University)
[178]

Contemporaneous or Close at Death? Two Late Classic Burials from the Medicinal Trail Community, Northwestern Belize.

Excavation of Group A at the Medicinal Trail Hinterland Community archaeological site in northwestern Belize, near the major polity of La Milpa, uncovered the remains of two individuals in cobble fill, interred semi-flexed. The upper individual was placed head to the east and feet to the west, while the lower individual was placed head to the west and feet to the east. Though there was, in some areas, fill located between the individuals, suggesting they may have been interred at different times, both show a high degree of skeletal articulation. Articulated vertebral columns, as well as pelvis and lower limb bones suggest contemporaneity of the burials, or at least very little time between interments. Though fragmentary, the burials, designated A-8-a and A-8-b, consist of well-preserved and diagnostic skeletal remains including cranial elements, and dentition, as well as post-cranial components. The level of preservation of the two individuals is remarkably better than previous burials at this site. This poster discusses the excavation process used, the osteobiography of each individual, their significance with regards to Maya mortuary practices, and the possible causes for the well-preserved remains. Additionally, an assessment of the timing of the interment of the two individuals will be provided.

Goebel, Ted (Texa A&M University)
[81]

Late Pleistocene Stone-Tool Technology at McDonald Creek, Alaska

Ongoing excavations at the McDonald Creek site, located in the Tanana Flats of central Alaska, have produced a large assemblage of stone debitage numbering in the thousands, as well as a small but expressive assemblage of retouched stone artifacts, including bifaces and unifaces. These come from two stratigraphically separate components, an earlier one dating to about 13,900–13,500 calendar years ago, and a later one dating to about 12,800–12,500 calendar years ago. In this poster we describe the assemblage, component by component, and we interpret aspects of raw-material procurement, production technology, and tool morphology and function. Based on these findings, we consider the significance of McDonald Creek's late Pleistocene occupations in the broader behavioral and cultural contexts of central Alaskan prehistory and paleoecology.

Goepfert, Nicolas [174] see Chamussy, Vincent

Golden, Charles [126] see Jimenez, Socorro
 Golden, Charles [54] see Roche Recinos, Alejandra
 Golden, Charles [265] see Scherer, Andrew
 Golden, Charles [202] see Schroder, Whittaker

Golden, Patrick [24] see Rabinowitz, Adam

Goldmann, Lukas (Deutsches Archäologisches Institut)

[107]

The Use of GIS and GeoServer for Landscape-Scale Geophysical Surveys: The Case Study of Mont Lassois

Since 2013 the German Archaeological Institute (DAI) has been conducting large-scale geomagnetic surveys in the vicinity of the Hallstatt period "princely seat" at Mont Lassois as part of the international, interdisciplinary research project "Vix et son environnement". Covering over 13 km² the DAI survey revealed numerous new sites as well as various details of known structures. In addition, excavations, aerial surveys, laser scans and different geophysical methods, contributed by other parties of the project, have revealed other features and additional information, resulting in large amounts of data which exceed the capacity of any single researcher. This talk aims to demonstrate the potential of WebGIS solutions to facilitate data integration and collaboration between different project parties. On the example of the Mont Lassois survey project on the idai.geoserver it is shown how this approach allows to combine a great amount of different data, adding up to an increasingly detailed picture of the landscape use of different prehistoric and historic periods.

Goldmann, Lukas [107] see Ruby, Bret

Goldner, Jonathan (University of Oxford)

[25]

Listening to Wood: Material Engagements with the Sound of Trees

My research studies how skilled agents use sound as a mnemonic device. Drawing on a case studies in Algonquin birchbark canoe building, I explore the multiple meanings of sound from the phenomenological aspects of aurality—the subjective perception of hearing and listening—and from the acoustic features of landscape arising from its formal material properties. I work through a Material Engagement Theory framework to develop an anthropological study of sound that aligns closely with Schafer's (1993) concept of the "soundscape," to consider how the sonic environment is understood by those who live in it; and with Feld's (1996, 2005, 2015) notion of "acoustemology," which treats "sound as a capacity to know and as a habit of knowing" (1996:xxvii). As Malafouris points out: "Understanding how external resources matter (causally and ontologically) for memory in their own specific ways emerges as a major challenge for cognitive archaeology and for material-culture studies." (2013:83). The ethnography documents important cultural differences in ways of listening and confirms an inseparable cognitive relation between the mind, geophysical icons and ecoacoustical properties. Ultimately, I propose the possibility that the human mind may possess sensory pathways that could be harnessed to recover long-lost wisdoms through sonic resonance.

Goldsmith, Dora [192] see Silverstein, Jay

Goldstein, Lynne (Michigan State University, Retired) and John Kelly (Washington University, Retired)

[56]

Harriet Smith, Educator and Archaeologist

Harriet Smith worked at the Field Museum of Natural History in Chicago for much of her long career. She was in the Education Department, and focused primarily on teaching high school students about archaeology and other disciplines. However, this simple statement does not do justice to Harriet's contributions to and impact on archaeology. She was the first professional woman to direct archaeological excavations at Cahokia, she worked elsewhere in the Midwest, and she conceived and directed a summer program focused on Anthropology for High School Students, initially funded by the NSF. This paper examines her contributions to Cahokia archaeology, as well as her unique contributions to educating and training several generations of archaeologists.

Goldstein, Lynne (Michigan State University, Retired)

[96]

Discussant

Goldstein, Lynne [72] see Mills, Barbara

Goldstein, Paul (UC San Diego)

[105]

Contextualizing Tiwanaku Geoglyphs and Petroglyphs in Time, Space and Settlement History, Moquegua and Locumba Valleys: Trail of the Art; Art of the Trail

This paper contextualizes recent systematic survey discoveries of Tiwanaku environmental art and their relation to Tiwanaku colonial settlement history. Most treatment of environmental art in the south central Andes has been largely iconographic in orientation. Conversely, settlement pattern and household archaeologies tends to treat environmental art as epiphenomenal adornments on the landscape. Beyond difference of approach, the empirical problem of securely assigning petroglyphs and geoglyphs to specific temporal and cultural affiliations in a multicomponent settlement landscape has stood in the way of synthesis.

Further, geoglyphs and petroglyphs could be palimpsests, accruing over centuries, making it impossible to assign authorship. Recent systematic survey data from the Locumba and Moquegua valleys may bridge these phenomenological and settlement pattern archaeologies with discovery of single component sites associated with environmental art. The paper will include 2019 discoveries of the Locumba Archaeological Project that include an isolated single component Tiwanaku site with environmental art. Linking geoglyphs and petroglyphs to larger settlement patterns of Tiwanaku habitation sites and trade routes will enrich understanding of the spatial and temporal context of colonization and exchange.

[105]

Chair

Goldstein, Paul [267] see Garvin, Arianna

Goldstein, Paul [260] see Gay, Brandon

Goldstein, Paul [61] see Santillan Goode, Julianna

Golitko, Mark (University of Notre Dame)

[29]

What Do Archaeological Networks Reveal? Comparing New Guinean Material Culture with Ethnographic Network Structure

Network analysis has become increasingly common within archaeological practice during the last decade, yet little consensus exists as to what networks based on material culture actually reveal about ancient social life. Archaeologists have variably interpreted communities or cliques derived from stylistic, technological, or provenience data as communities of practice, ethnic markers, or catnets. However, archaeological network practitioners have yet to offer a compelling linkage between material networks and anthropological and archaeological understandings of process and structure. I report on the results of a comparison of twentieth-century ethnographic material from the island of New Guinea with the structure of inter-community ties as documented by over a century of intensive ethnographic research. The results show that underlying patterns of interaction do significantly structure material cultural patterning, but that the relationship is complex and does not allow for easy network reconstruction based on archaeological material. Nor does material culture clearly code ethnic or linguistic structure. This leaves open the question of what cultural and social significance shared material culture may index, and suggests that more sophisticated network inference algorithms may be required to construct meaningful networks from archaeological data.

Gomani-Chindebvu, Elizabeth [38] see Radican, Kelsey

Gomez Mejia, Juliana [21] see Dalton, Jordan

Gonçalves, Célia (ICArEHB, Universidade do Algarve), Claudia Umbelino (CIAS, Universidade de Coimbra), João Cascalheira (ICArEHB, Universidade do Algarve), Lino André (ICArEHB, Universidade do Algarve) and Nuno Bicho (ICArEHB, Universidade do Algarve)

[34]

Recent Evidence on the Human Burial Practices at the Mesolithic Shell Midden of Cabeço da Amoreira (Muge, Portugal)

The Muge shell middens have provided, in more than 150 years of research, one of the most numerous and well-preserved collections of Mesolithic human remains in Europe. Unfortunately, despite the high number of burials found during the initial campaigns, very little information is currently available about their provenance and association with archaeological materials. Starting in 2008, a series of new excavation campaigns have been carried out at Cabeço da Amoreira, allowing to recover, so far, a total of five human burials, from different stratigraphic contexts within the mound. This poster presents new data regarding the spatio-temporal variability of these burials. The application of modern techniques allowed to recover unprecedented information on each context, and to establish a more complete reconstruction of the burial practices at the site.

Gonçalves, Célia [250] see Bicho, Nuno

Gonçalves, Célia [34] see Cascalheira, João

Gonciar, Andre [169] see Bews, Elizabeth

Gonzal, Edith [252] see Perdikaris, Sophia

Gonzales, Mikayla (University of New Mexico), Amy Thompson (University of New Mexico) and Keith Prufer (University of New Mexico)

[7]

Geospatially Modeling Neighborhoods Using Least Cost Paths at the Classic Period Maya Center Uxbenká

Social communities of the past can be modeled in many different ways and undoubtedly our interpretations of these models are influenced by the methods in which we use. We evaluate three methods of modeling social communities by comparing a Least Cost Path Analysis (LCP), with previously conducted Nearest Neighbor Analysis (NNA) and R Cluster Analysis, to examine neighborhoods at the Classic Period (AD 250–800) Maya center, Uxbenká. Uxbenká is a medium sized polity located in Southern Belize. Using 136 settlements over a 21 km² area, we use a LCP to model transportation routes from Uxbenká's central market to hinterland households using the slope of the terrain. The data is then compiled to evaluate how commonly used paths may be indicators of social communities. Considering that individuals traveling on the same path have more person to person interactions

with one another causing them to form closer relations. Therefore, the LCPs may reflect smaller social units such as neighborhoods. These results indicate that the LCPs, NNA, and R Cluster Analyses produce generally similar yet, slightly different, geospatial neighborhoods. This study emphasizes the importance of using multiple methods to examine social communities of the past.

González Lombardi, Andrea (Universidad de Ingeniería y Tecnología)

[224]

Piura la Vieja: A Tallan Center under Successive Imperial Regimes (1000 aC–1578 dC)

The goal of this research is to continue archaeological investigations at the Inca and early Spanish settlement of Miguel de Piura. Formally established by the Spaniards in 1532 dC, the town of Miguel de Piura was the major Tallan center and became a provincial during the Inca occupation of the Northern Andes. While historians have long noted the importance that the town held in the early Spanish history of Peru, little archaeological work has been conducted to understand the history of the site under successive imperial regimes. This project proves an opportunity to archaeologically examine the lives of those who lived at town and its functioning during the Inca empire and the early decades of Spanish expansion into Peru. By doing so, this project will also examine a range of theoretical issues that explore how the Inca and the Spaniards attempted to incorporate newly conquered regions into their growing empire and the responses of local inhabitants to imperial practices.

Gonzalez, Juan (University of Texas Rio Grande Valley), Roseann Bacha-Garza (University of Texas Rio Grande Valley), Christopher Miller (University of Texas Rio Grande Valley) and Russell Skowronek

[6]

Projectile Points on the Periphery: Augmented Reality Poster for Research and Education on the Lower Rio Grande

Projectile points are the primary surviving evidence for the presence of native peoples in the Lower Rio Grande Valley (Cameron, Hidalgo, Starr, Zapata and Webb counties of South Texas, and the states of Nuevo Leon and Tamaulipas in Mexico) during the past 10,000 years. The projectile point poster of the LRGV displays a selection of over 80 of the most representative points organized chronologically by archaeological time period from Paleoindian to Historic times. The poster features points made of stone, shell, glass and metal, and highlights the decrease in point size from large darts that were used with atlatl, to small arrow heads that were used with the bow and arrow. All points are reproduced to scale to facilitate comparison. The most innovative feature of this product, is that it incorporates state of the art augmented reality highlighting 2D and 3D images of most points as well as animations, videos, material descriptions, collections and maps. It is intended as an educational tool for K-17 students, the general public and the amateur archaeologist to promote awareness of the importance of preserving and reporting cultural materials.

Gonzalez, Juan [126] see Skowronek, Russell

Gonzalez, Nancy [101] see Howe, Mark

González Guzman, Zitlalli Teresa (Centro de Estudios Antropológicos, UNAM)

[121]

Piedras Tacitas: Un estudio de Morteros en los Berros, Durango

En los Berros, Durango, esparcidos por el cerro se encuentra una gran cantidad de rocas con orificios que varían en forma, tamaño, cantidad y profundidad. Estas manifestaciones culturales han sido llamadas por los arqueólogos morteros o piedras tacitas y se ha planteado que tenían una función votiva, de molienda e incluso de uso astronómico. Pero, ¿para qué las utilizaban los habitantes de los Berros? En el presente cartel abordaré los primeros resultados de este estudio, obtenidos a través del análisis de sus características y ubicación, con el afán de ofrecer respuestas preliminares a esta pregunta.

Gonzalez Herrera, Ulises [173] see Naegele, Kathrin

González Lauck, Rebecca [191] see Sánchez Torres, Edgar Octavio

González López, Ángel [227] see Shiratori, Yuko

González-Hernández, Galia [10] see Beramendi-Orosco, Laura

González-Hernández, Galia [10] see Soler-Arechalde, Ana

Goodale, Nathan (Hamilton College) and Colin Quinn (Hamilton College)

[253]

Inter-analyst Reliability and Replicability of Curation Indices

One of the most productive recent advancements in the study of lithic technological organization has been a greater understanding of stone tool use-life history. Measures of curation, or indices to detect the amount of realized to maximum utility, are a subject that William Andrefsky Jr. directly contributed to in a number of ways. Archaeologists have employed curation indices to better understand human interaction and utilization of stone as a tool resource. Using curation indices, researchers have been able to discuss the implications of raw material quality and availability, how stone tools are embedded in past human lifeways and procurement practices, and the socioeconomic relationship between human behavior and the activities they engage in. The utility of

these interpretations, however, are built upon an assumption that the measurements that underpin these indices are both reliable and replicable. In this paper, we test three reduction indices for reliability and replicability on an inter-analyst level. Results indicate that while some indices are more reliable, their replicability is variable. Based on these results, we suggest some best practices for developing new, and applying existing, curation indices.

[253]

Chair

Goodale, Nathan [5] see Pike, Sabrina

Goodby, Robert (Franklin Pierce University)

[12]

Household Size and Organization at the Tenant Swamp Paleoindian Site

Four well-defined Paleoindian house floors radiocarbon dated to 12,600 BP were excavated at the Tenant Swamp site in Keene, New Hampshire. Believed to be a winter occupation during the Younger Dryas, these dwellings were oval in shape and organized in defined zones with a central hearth, a defined work area, and an "empty" space along the outer wall of the dwelling that likely served as a sleeping area. Household size is estimated from the size of the sleeping area, and household economics are inferred from faunal remains and use-wear analysis of flaked stone tools. In contrast with other regional Paleoindian sites, there is little evidence at Tenant Swamp for hunting or fluted-point manufacture, but ample evidence for hide processing, woodworking, and other activities. The households at Tenant Swamp are contrasted with each other to assess variation in household size and activities, and comparisons are made with other well-defined Paleoindian dwellings in the northeast, notably from the Vail and Bull Brook sites.

Goodmaster, Christopher

[16]

Hueco Tanks: Survey, Documentation, and Analysis of Rock Art Imagery in the Jornada Mogollon Region

Hueco Tanks is a cluster of low volcanic mountains located at the eastern margin of the Hueco Bolson, a high-altitude desert basin near the Texas-New Mexico border in eastern El Paso County, Texas. The site is within the Jornada Mogollon archaeological region and has been a location of human use and occupation for at least 10,000 years. Most notably, the site contains hundreds of painted rock art imagery panels representing the iconographic styles of the region. The site has been visited on numerous occasions by rock art enthusiasts and photographers, avocational members of regional archaeological societies, art historians, ethnographers, and professional archaeologists. This presentation will focus on recent survey, documentation, and analysis efforts regarding the rock art imagery at Hueco Tanks. These recent efforts indicate that, additional panels and elements remain to be discovered within the rugged desert terrain. In addition, modern digital and geospatial methods of recording and analysis can contribute to the documentation and analysis of this major corpus of regional iconographic imagery.

Goodsell, Joanne [256] see Kraus, Geneva

Goodwin, Rebecca [64] see Hodgetts, Lisa

Gorczyk, John (Cornell University)

[22]

Caprines in the Cattle Zone: Reconciling Faunal Data at Two Scales during the Early Neolithic in the Sofia Basin, Bulgaria

Animal husbandry was a major adaptive mechanism facilitating the spread of farming communities throughout southeastern Europe. Recent big-data syntheses have contributed greatly to our understanding of the environmental and social processes of neolithization in the region. While faunal reports often form an integral component of these studies, issues of data standardization and analytical choices understandably prevent achieving the resolution needed to investigate human behavior and decision-making at the site level. This can lead to a mischaracterization of human-animal relationships at the smaller scale on which they are enacted. The early Neolithic (ca. 6100–5800 BCE) site of Slatina in Bulgaria's Sofia Basin provides a useful example. From a regional perspective, Slatina appears to be in the more temperate zone of increased reliance on cattle husbandry. The zooarchaeological and isotopic data presented here offer a zoomed-in look at herding, landscape use, and consumptive practices based on a mixed management strategy primarily focused on caprines. This study highlights the potential of faunal data to weigh in on prehistoric phenomena at multiple scales while stressing the central role zooarchaeology should play at the interpretive level by providing useful proxies on human behavior at the smaller scale of a site and its environs.

Gordon, Falcia (University of Alabama), Linda Derry (Old Cahwaba Archaeological Park) and Eric Sipes (Alabama Historical Commission)

[193]

Uncovering Alabama First Statehouse: A Successful Partnership at Old Cahawba Archaeological Park in Dallas County, Alabama

Over the summers of 2016 and 2017, two divisions within The University of Alabama Museums Department helped create successful outreach programs in Dallas County, Alabama with the support of some strategic partners, namely the Alabama Historical Commission, among others. The Office of Archaeological Research was contracted by the Alabama Historical Commission to conduct a multi-focal archaeological program due in part to the focus on the 200 anniversary celebration of statehood at Old Cahawba Archaeological Park. Multiple geophysical surveys were conducted to find the footprint of Alabama First State House, which was commissioned to be constructed by Alabama's first governor William Wyatt Bibb in 1819. This geophysical project lead to excavations of the footprint of the state house by the Office of Archaeological Research in 2016 and the Alabama

Museum of Natural History Expedition in 2017. Public archaeology was incorporated into the research designs resulting in Public Archaeology and Artifacts Days, which included lectures and hands-on learning. Portions of the summer projects were also filmed by the Emmy award winning crew of *Discovering Alabama* for an episode on Alabama's state capitals.

Gore, Angela (Center for the Study of the First Americans, Texas A&M University)

[30]

Mapping the Lithic Landscape: Alluvial Adventures and Geochemical Characterization in the Nenana Valley, Alaska

The Eastern Beringian record is crucial to understanding human dispersal and adaptive behaviors of the first humans in Alaska. Investigating how prehistoric humans provisioned themselves upon the landscape is significant in answering questions of human adaptation and landscape use in response to cultural and environmental change. Portable x-ray fluorescence (pXRF) studies are useful for exploring human behavior and toolstone procurement strategies, however, sourcing studies on non-obsidian volcanics such as basalts, dacites, rhyolites, and andesites are in their infancy in Beringian archaeology. These materials comprise a significant amount of the lithic record of interior Alaska, offering potential insight into the adaptive behaviors of ancient Alaskans as they colonized and learned the landscapes around them. This paper presents the results of my dissertation research seeking to map the distribution of knappable toolstones on the landscape to compare to geochemical (pXRF) analyses of volcanic artifacts from eighteen Late Pleistocene and Holocene cultural components in the Nenana Valley, Alaska to address toolstone provisioning strategies of the past. These results underscore the importance of comparing both primary (outcrop) and secondary (alluvium) sources of toolstone to artifact collections from the valley to explore how prehistoric Alaskans procured and used local and extra-local toolstones through time.

Gorenflo, L. J. [102] see Nichols, Deborah

Goring, Daniel, Tammy Buonasera, Jelmer Eerkens and Meredith Carlson

[83]

Learning Strategies and Ground Stone Tools: Understanding Cultural Transmission through Experimental Archaeology

Tool use and morphology are transmitted culturally among humans. Tool use is affected by social learning, individual learning (trial-and-error), and a range of cultural transmission biases. Ethnographic and experimental studies of cultural transmission regarding tool use are limited. This study contributes to that body of knowledge by examining different learning strategies in the use of ground stone tools. We analyze longitudinal data on grinding efficiency from experimental processing of a small wild seed resource (Indian ricegrass; *Achnatherum hymenoides*) and a large seed/ nut (black oak acorns; *Quercus kelloggii*), using several types of mortars and grinding slabs. Control groups include observational social learners and individual trial-and-error learners. We gauge both the efficiency of different milling tools and the learning curve associated with each tool type. We apply these data to theory connecting the costs and benefits of different types of learning with different social contexts of use.

Goring, Daniel [83] see Carlson, Meredith

Gorman, Alicia (UC Santa Barbara) and Christian Cancho Ruiz (Museo de Sitio Arturo Jiménez Borja-Puruchuco)

[21]

(Re)constructing the Social Structure of Society at Cerro Tortolita through Its Ceramic Assemblage

In this study, I use the ceramic assemblage at Cerro Tortolita as a means of addressing issues related to social differentiation. Cerro Tortolita is an Early Intermediate Period site occupied from about 250–450 AD in the Upper Ica Valley on the south coast of Peru. It includes a large ceremonial component as well as a sizable residential area, and its Early Nasca style ceramics suggest that it was a participant in a pilgrimage and ceremonial network based at the neighboring site of Cahuachi in the Nasca Valley. In a previous study of the ceramic assemblage from the Ceremonial Zone of Cerro Tortolita I found evidence of feasting in restricted-access ceremonial contexts as well as in a large public plaza. Recent excavations in the Primary Residential Zone of the site now permit a comparison of assemblages between the two zones to further study the social structure at the site. Ceramics provide an important line of evidence in determining whether religious authority was a) restricted to the Ceremonial Zone and b) correlated with other types of power, such as political and/or economic. Through focusing on commoner contexts this study includes them as actors in the construction of their own societies.

[21]

Chair

Gorman, Alicia [21] see Cancho Ruiz, Christian

Gorogianni, Eugenia (University of Akron)

[263]

The Elusive Household: Household and Wealth in Ayia Irini, Kea

The household has been a topic of considerable anthropological interest since membership in a residential unit is often held as one of the prerequisites for belonging to the wider political, religious and cultural groupings. Therefore, if one is to understand the contribution and dynamic of a settlement in the broader regional network, one has to begin with an appreciation of the households within it. This paper focuses on the settlement of Ayia Irini on the island of Kea (Aegean, Greece) and puts the spotlight on the households dating from the end of the Middle Bronze Age to Late Bronze II. Aided by GIS and ethnographic analogies, a delineation of various households is proposed based on a combination of various types of archaeological evidence, such as hearths, concentrations of cooking paraphernalia, and storage facilities. Households are analyzed in order to assess their position within the socio-economic landscape of the site and trace patterns of social interaction (from cooperation and peaceful coexistence to competition and conflict).

Gosner, Linda [35] see Smith, Alexander

Goudge, Charlotte (University of Bristol)

[146]

Chair

Goudge, Charlotte [146] see Bord, Arik

Gover, Carlton (University of Colorado Boulder & Pawnee Nation of Oklahoma) and Emily Van Alst (University of Indiana, Bloomington)

[41]

Seventh-Generation Indigenous Archaeology in the Twenty-First Century

Indigenous archaeology in the twenty-first century is fast becoming a diverse and important paradigm within archaeology. The mission of this topic is to explore the various methods, theories, and practices utilized by contemporary indigenous tribal citizens engaged in unique practices in North American archaeology. This paper seeks to explore potential directions of indigenous archaeology and its coalescence with other contemporary archaeological paradigms.

[41]

Chair

Gozner, Amanda, Peter Ungar and Erik Otarola-Castillo

[147]

Analysis of Microwear Dental Morphology

Dental microwear morphology can be used to show the effects that different subsistence strategies and dietary lifestyles may have upon dentition. This study analyzes the morphology of dental microwear between different foragers and farmers to identify statistically different shaped microwear modifications. Using 3D images of microwear dental modifications from hunter-gatherers and farming societies, individual modifications were isolated to discriminate between microwear morphology. The overall 3D shape of the isolated modifications were then compared. These data are used to show differences in the modification's morphologies and exhibit statistical differences. Using this approach allows future use of morphometrics with Bayesian methods to compare unidentifiable or questionable microwear modifications.

Graf, Kelly, Nathan Shelley (CSFA, Texas A&M University) and Julie Esdale (CEMML, Colorado State University)

[81]

Stratigraphy, Chronology, and Site Formation at the McDonald Creek Site, Interior Alaska

The McDonald Creek site is a deeply buried, multicomponent site located about 30 miles south-southwest of Fairbanks, Alaska, in the Tanana Flats. We began testing this site in 2013 and commenced full-scale excavations in 2016. In this poster, we will present site stratigraphy, preliminary results of basic descriptive sediment analyses, and radiocarbon dating. McDonald Creek preserves three cultural components found in well-stratified eolian depositional contexts. Component 1 dates to ~13.8 ka. Component 2 dates to ~12.7 ka, and component 3 dates to ~5 ka. Due to the nature of deposition and minimal postdepositional disturbances, clear cultural features were found preserved in component deposits. We will address natural formation as well as paleoecological conditions gleaned from our preliminary analyses of the site's sediments.

[81]

Chair

Graf, Kelly E. [81] see Forget Brisson, Laurence

Graf, Kelly [81] see Henry, Aureade

Graham, Anna (University of North Carolina at Chapel Hill) and Megan Kassabaum (University of Pennsylvania)

[222]

Exploring Non-Artifactual Evidence for Mound Construction and Use: A Case Study from Southwest Mississippi (AD 1200–1350)

The tradition of moundbuilding in the southern Lower Mississippi Valley extends back nearly 6000 years. Unsurprisingly, over that long history, the activities and building practices that surrounded these earthen constructions varied. In this paper we explore questions of how mounds were built and used based on our recent excavations at Lessley, an early Plaquemine period (AD 1200–1350) mound site located in southwestern Mississippi. Excavations in the summer of 2019 focused on the mound flanks and summit and encountered several construction phases as well as pre-mound deposits. Excavation units at the base of the mound revealed the use of purposefully constructed berms during the early phases of mound construction and suggested that large, leaning posts may have also been used to support the earthen fill during the construction process. Excavations on the summit revealed an incipient A-Horizon on the penultimate mound surface suggesting a more protracted history of mound construction than was revealed by previous investigations. We consider these findings in the context of site use over time as well as within broader regional patterns related to mound construction and use. In addition, we draw attention to the importance of considering the construction process as a potential explanation for archaeological features.

Graham, Carole (Mesa Verde National Park), Sheldon Baker (Mesa Verde National Park) and Joel Gamache (Mesa Verde National Park)**[165]***Razor Blades, Toys, and Footers—Documentation of the Historical Mesa Verde Company's Cabin Concession Area (5MV4450), Mesa Verde National Park, Colorado*

Archeologists at Mesa Verde National Park recently had the opportunity to document historical site 5MV4450, the Mesa Verde Company's cabin and tent cabin concession area, located in the Headquarters Loop on Chapin Mesa. The cabin concession area was constructed and used from just before WWII through the early Cold War years (circa 1939–1960s). Although no standing architecture remains, structure footprints, utilities, and hundreds of artifacts—including soda bottles, toiletry items, and toys—were documented. Mapped using Esri's Collector app, with real-time data correction in the field, archeologists were able to make immediate, accurate comparisons of structural remains and other features with those depicted on historical maps and plans. Investigations at 5MV4450 allow a glimpse into the vacation lives of Mesa Verde visitors during the mid-twentieth century, creating a detailed snapshot of a particular time and place in the history of tourism and the development of visitor services by the National Park Service.

Granados, Rosario (Blanton Museum of Art), Astrid Runggaldier (Department of Art and Art History), Catherine Popovici (Department of Art and Art History) and Kendyll Gross (Department of Art and Art History)**[109]***Knowledge to Share: A Reflection on the Collaboration between the Blanton Museum of Art and the UT Art and Art History Collection*

The last half century has seen great strides in creating laws and changing the way in which Latin American archaeological materials circulated internationally, becoming part of private collections or public institutions. While contemporary regulations spell out practical and ethical protocols for today, there are more indeterminate standards for engaging with existing collections that are the result of older collecting criteria. This presentation outlines the approach regarding the contemporary ethics of exhibition and display undertaken by an interdisciplinary team from the University of Texas at Austin during the installation of two rotations of selected objects from UT's Art and Art History Collection at the Blanton Museum of Art. For these 18 month-long displays a museum curator, a faculty member, and two graduate students engaged in fruitful collaboration, reflecting on the historical approaches to collecting practices but also on the nuances of curating an exhibition space, where art historical and archaeological perspectives were combined. By bringing together these separate realms, we successfully created a unique pedagogical opportunity for students beyond the classroom, while also sharing knowledge with broader constituencies that hitherto had limited access to objects from the ancient Americas on campus and in Austin at large.

Grant, Christopher [129] see Kennedy, J Ryan

Grant, Helen [229] see Gaffney, Isabella

Grant, Sharon (Field Museum of Natural History)**[218]***Discussant*

Grant, Vernelda [184] see Castleberry, Cala

Gratuze, Bernard [30] see Sánchez de la Torre, Marta

Grauer, Kacey**[272]***Politicizing Post-humanism: Elite and Commoner Household Excavations at the Ancient Maya City of Aventura, Belize*

Post-humanism importantly considers active roles of non-humans entities in society. However, it is crucial that power relationships between people do not fall by the wayside when studying past societies. In this paper, I approach geological features at the ancient Maya city of Aventura, Belize from a perspective that intertwines post-humanism and political ecology. Pocket bajos are geological features that provided important resources to the people living at Aventura, and their role in activities such as ancestor veneration suggests they were active members in community-building. However, these features were not drivers of inequality. Aventura was a socioeconomically diverse city and households of various statuses were able to access pocket bajos. This paper presents data from survey, excavation, and phytolith analysis from recent research at Aventura and juxtaposes two households—one elite and one commoner—on the edges of pocket bajos. Interestingly, the commoner household was more deeply connected to the pocket bajo than the elite: it has a longer and more consistent history of engagement. I argue that although the landscape was indeed an active part of ancient Maya society, power relationships between humans is what (re)produced inequality between humans at Aventura.

[272]*Chair*

Grauman, Kristen [175] see Payntar, Nicole

Graumlich, Emma (Florida State University)**[66]**

Paleoenvironmental Analysis through Gastropods at the Page-Ladson (8JE591) Inundated Terrestrial Site, Northwest Florida, USA
Excavations at the Page-Ladson site located in the Aucilla River in northwestern Florida have revealed extensive inundated sediment sequences dating from approximately 16,000 to 8,500 years ago. These sediments contain artifacts that span from the Pre-Clovis period (14,500 years old), through the Clovis period (13,200 years old), and into the Early Archaic period (11,200 years old). In addition to the stone tools and megafaunal bones that inform about the lifeways of pre-Clovis peoples, the sediments house environmental indicators that contribute to our understanding of the regional paleoenvironment. One such indicator is preserved gastropod shells. Gastropods, a large taxonomic class within the phylum Mollusca, are one of the most valuable proxies for reconstructing past environments. This is due to their commonness at archaeological sites and the organism's sensitivity to even the smallest of environmental changes. Through the sampling and analysis of gastropods at the Page-Ladson site, this study hopes to increase our understanding of the local environment that the site's inhabitants would have experienced, to help explicate the tempo of late Pleistocene and early Holocene environmental changes at the site, and, when combined with the extensive paleoenvironmental proxy records from the site, demonstrate the utility of gastropods for paleoenvironmental reconstruction.

Grávalos, M. Elizabeth (University of Illinois at Chicago)**[174]**

What Is Huarás? A Ceramic Compositional Approach to the Post-Chavín "White-on-Red" Style in Highland Ancash, Peru
Sandwiched between the well-known Chavín and Recuay ceramic styles of highland Ancash, "Huarás White-on-Red" pottery (ca. 200 BCE–200 CE) has received little academic inquiry. Archaeologists have recovered Huarás burnished redware vessels with painted white geometric motifs in post-Chavín layers at numerous sites across highland Ancash, including Chavín de Huántar. Huarás is notable in its complete divergence from earlier incised styles that portrayed anthropomorphic and zoomorphic imagery associated with the Chavín religious tradition. While we know that people consumed Huarás pottery across a broad region, we do not know the techniques and raw materials they used to produce it. This paper explores the enigmatic Huarás style through the lens of compositional analyses of ceramic pastes. I present preliminary interpretations of petrographic thin-section analysis and laser-ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS) of White-on-Red pottery and contemporaneous utilitarian wares from the site of Jecosh in the southern Callejón de Huaylas valley. I compare these data with a sub-sample of White-on-Red pottery from two other sites in the Callejón de Huaylas with established Huarás occupations: Hualcayán and Queyash Alto. This work contributes to the conversation on post-Chavín political economy in the North Central Andes through an evaluation of ceramic production and consumption.

Grave, Peter [168] see Stark, Miriam

Gravel-Miguel, Claudine [38] see Cabadas, Horacio

Graves, Michael**[255]***The Power of Inference in Archaeology: Making Sense of Alan Sullivan*

How archaeologists create and employ inference has been central to the intellectual contributions of Alan Sullivan over the past 40 years. He did not invent this topic but iconoclast that he is, Sullivan has made the examination of the philosophical, methodological, and substantive aspects of inferring past events and processes a lifetime achievement. Along the way he, his colleagues and students have advanced our understanding of Southwestern prehistory based on lithic reduction sequences, the information value of surface archaeology, including "lithic scatters," site-based evidence for ceramic manufacture, fire-based shifting cultivation, and the design of archaeological surveys. Linking these topics, Sullivan emphasized the identification of variability in the archaeological record and the means for apportioning it among various factors and dimensions of human experience.

Graves, Michael [262] see Moore, Summer

Graves, Michael [252] see Peck, Katherine

Graves, Timothy (Versar Inc.) and Myles Miller (Versar Inc.)**[136]***Beyond the Communal Structure: Engagements with the Landscapes of Southern and Southeastern New Mexico*

Over the past decade, excavations have clarified the nature of social and ritual practice in the communal structures of Jornada pithouse and pueblo settlements. Equally significant is the evidence accumulated during a decade of survey and remote sensing projects that reveals a broader geographic dimension of social and ritual engagements with sacred and ideational landscapes surrounding the village. The engagements with sacred landscapes involved different forms of placemaking, some of which were materialized through the creation of shrines, pilgrimage trails, and rock art. Shrines include cave shrines, shrines below rock art panels, and open-air shrines, the latter often associated with sacred peaks and viewsheds. Rock art is often found in shrine caves, expressing symbolic and metaphorical links to concepts of ancestors, emergence, and rain-making. An integrated analysis of survey data, GIS data processing, and remote sensing defined a trail leading from a large plaza pueblo to a shrine cave in the surrounding mountains—an archaeologically defined pilgrimage route that confirms certain caves served as pilgrimage destinations. These examples reveal how thoughts and actions performed within communal structures were translated and materialized beyond the confines of the village, and how such practices served to integrate Jornada society.

Graves, William (University of Arizona)**[142]***Power, Identity, and La Présence Plains*

I use Stuart Hall's concept of *Présence* to explore the intersection of power and identity among the Jumanos pueblos, a group of Late Prehispanic and Early Colonial period pueblos in New Mexico occupied from AD 1300 to the 1670s. *Présences* are sets of relations, meanings, and material symbols that are variously combined to create identities. The Jumanos pueblos shared a group identity for hundreds of years that was constructed with reference to different *présences*, including cultural traditions and social relations with the southern Plains. This engagement with a *Présence* Plains also provided a critical avenue for prestige enhancement and the creation of inequalities among the Jumanos pueblos: bison acquisition. The distribution of bison remains is not equal among different sites and the residents of one village, Gran Quivira, appear to have enjoyed greater access to socially valuable bison and the prestige that came from such access. Bison was procured through exchange with Plains groups, in part through the hosting of trade fairs, and directly through hunting. Through such engagements with a *Présence* Plains, both power and identity were created, experience, and transformed, and the Jumanos pueblos provide an ideal context to explore the complex relationship between these two social phenomena.

Gray, D. Ryan (University of New Orleans) and Harald Stadler (University of Innsbruck)**[188]***Building International Partnerships for Aviation Archaeology: Case Studies from Central Europe*

In 2017, the University of New Orleans Department of Anthropology and Sociology entered into a partnership with the Defense POW/MIA Accounting Agency to conduct archaeological field schools at WWII era aircraft crash sites in Europe, in order to further DPAA's mission of making the fullest possible accounting of missing-in-action U.S. personnel. The partnership builds upon the university's existing international education resources and its long-standing relationship with the University of Innsbruck in Austria to introduce students to the DPAA's forensic archaeological methods and to aviation archaeology as a field. The first of the two field schools conducted so far, the excavation of a P-51 crash site associated with the loss of a Tuskegee Airman, Captain Lawrence Dickson, highlights the possibilities for the scientific documentation of aircraft crash sites, while the second demonstrates the scale and complexity of larger loss sites.

Gray, Michelle**[273]***African and Afro-Caribbean Cultural Identity, Vessel Function, and Interisland Connectedness in Eighteenth- through Nineteenth-Century St. Croix, U.S. Virgin Islands*

As part of the Slave Wrecks Project, excavations at Christiansted National Historic Site on St. Croix, U.S. Virgin Islands, have resulted in the collection of thousands of artifacts associated with the Danish West India and Guinea Warehouse Complex. Within this assemblage hundreds of sherds of Afro-Caribbean colonoware, or Afro-Cruzan ware, have been identified. Former analysis of the colonoware established a typology as well as suggested local manufacture. In this presentation I discuss the methods used to reevaluate the typology and function of Afro-Cruzan wares as a product and symbol of the Trans-Atlantic Slave Trade. This study includes provenance analysis to determine whether or not these wares were produced locally on St. Croix or elsewhere to identify potential spheres of interaction, and if the same sources of material were used in prehistoric times. Additionally, insight into potential influence these wares had on the evolution of African and Afro-Caribbean foodways will be presented. It is proposed that Afro-Cruzan ware represents cultural and economic perseverance, despite colonial oppressive conditions. Thus, this research highlights enslaved and free Africans' lives as they sought to maintain autonomy through daily tasks expressed through ceramic traditions.

Greco, Annie [264] see Mollerud, Katy

Green, Adam (University of Cambridge), Darryl Wilkinson (University of Cambridge) and Toby Wilkinson (University of Cambridge)**[33]***The Impacts of Triadic Processes on the Diverse Social Trajectories of Ancient Civilizations*

The degree to which an ancient civilization's socio-transportation system was terrestrial, aquatic-linear or aquatic-radial impacts many aspects of its social structures. These variables are incorporated within the triadic model, along with a novel approach for classifying and analyzing them. Transportation systems were tempered by available technologies and surrounding environments, which had major impacts on urban provisioning, exchange and economic specialization, and political administration. In this paper, we explore the implications of the triadic model in the ancient Andes, South Asia and Mesopotamia using computational techniques. We find that with changes in scale, ancient civilizations could advantage of different triadic configurations, encompassing different transportation systems or transforming one system into to another. We also find that terrestrial system placed limits on the spatial extent of political and economic interaction, reducing settlement size and lowering the broader impact of urbanization. Aquatic systems, on the other hand, place a much higher limit on transportation away from points of production, contributing to urban growth and economic specialization. In these and other ways, triadic processes appear to have impacted urbanization and political organization in regular ways that nonetheless produced a diverse range of social processes in ancient civilizations.

[33]*Chair*

Green, Adam [272] see Bates, Jennifer

Green, Adam [48] see Petrie, Cameron

Green, Adam [33] see Wilkinson, Toby

Green, Amie (University of Missouri) and Kate Trusler (University of Missouri)**[212]***What about a Sponge on a Stick? Insights into Public Perspective on Pompeian Sanitation and Water*

Along with its huge influx of annual visitors, Pompeii's ongoing research and excavations are constantly revealing new information about the city and its inhabitants. After conducting research on Pompeii's sanitation and water systems, the authors discovered discrepancies in the information that was being conveyed to tourists, or in some cases, a lack of discussion on certain water system features. Only recently have archaeologists turned more attention to subjects such as water and sanitation systems, and most of this information remains elusive to the public. In an effort to discover how the general public perceives the topic of water and sanitation systems in Pompeii, twenty-five short and informal interviews were conducted during a four-week period. Also, observations were made of English tour guides in order to understand what information was revealed to tourists about Pompeii's water and sanitation systems—or if they were even identified at all. This paper addresses the public's perception on more mundane, but no less important, topics of Pompeii's archaeology and concludes that a general lack of knowledge on the topic only serves to create gaps in people's understanding of the past. Finally, we intend to suggest ideas for increasing public knowledge on this topic.

Green, Kirsten [169] see Izzo, Victoria

Green, Kirsten [178] see Messinger, Emma

Green, Margerie (Archaeological Consulting Services Ltd.) and Shereen Lerner (Mesa College)**[98]***Collaborative and Interdisciplinary: The Steve Plog Method of Archaeology*

We first met Steve Plog when we worked on the Chevelon Archaeological Research Project with his brother, Fred, and then we worked more directly with Steve on the Black Mesa Archaeological Project. Looking back over our careers, it is clear that, as is the case with many professors, Steve provided important training we needed to learn and develop as archaeologists, although in his case, it was never in the context of an actual class. Steve encouraged us to work cooperatively with other archaeologists as we learned not only about Southwestern archaeology, but also how to conduct fieldwork using a well-developed research design and site recording framework. He introduced us to the conduct of interdisciplinary archaeological research, an approach we continued to employ throughout our careers. With hindsight, we more fully appreciate the extent to which Steve provided us with real-world opportunities for formulating research designs, accessing data, conducting research, publishing, presenting, and growing as professionals. Our current presentation will highlight how our experience with Steve helped guide our professional careers, which in one case included the development of a successful contract archaeology consulting firm, and in the other, involved teaching undergraduate students about the importance of the past.

Green, Olivia (Texas State University), Ashley McKeown (Texas State University) and Nicholas Herrmann (Texas State University)**[215]***Comparing Patterns of Skeletal Pathology in Enslaved Africans from an Eighteenth-Century Cemetery on St. Eustatius*

This research investigates the patterns of skeletal pathology of 15 enslaved individuals in an eighteenth-century cemetery on St. Eustatius. Nine different pathology markers were analyzed from the 15 individuals of St. Eustatius and compared to individuals from the Newton Plantation Cemetery on Barbados and the New York African Burial Ground to see if the trade-based economy of Statia affected slave health and quality of life. Frequencies of each marker was calculated. Schmorl's nodes and vertebral osteophytes were most frequent in the St. Eustatius individuals. In addition, rates of enthesopathy and periostitis were significantly lower on St. Eustatius than compared to the other sites. The remaining pathological markers had relatively comparable frequencies. Despite comparable frequencies, the degree of each marker measured at the Newton Plantation Cemetery and the NYABG were more severe as compared to the St. Eustatius sample. This difference in severity of pathological conditions indicates the island's trade-based economy may have affected the enslaved population by reducing physical strain on their bodies in comparison to contemporaneous enslaved populations. This comparative study is important in adjusting biased historical accounts of slavery on St. Eustatius and in understanding the stresses associated with slavery.

Greene, Janaka (Texas State University)**[66]***The Capshaw Site (41DF22), a Late Paleoindian Site in the Texas Panhandle*

The Capshaw site (41DF22) is a Late Paleoindian Cody Cultural Complex lithic scatter camp site located in Deaf Smith County, TX. The Southern High Plains region is an area which is well documented for containing Paleoindian sites that shaped archaeologists' understanding of Paleoindian peoples' behavior and activities on the landscape. However, the Cody Complex remains relatively poorly understood. The site appears to be a single or limited occupation site that may represent a residential camp. Lithic analyses were carried out on all artifacts recovered from the site, and use-wear analyses were conducted to help understand site-use that occurred at Capshaw. Investigations into the site intend to shed light on both the importance of knowledge gleaned from lithic scatter sites and to better understand the kinds of activities and behavior which occur at camp sites occupied by Late Paleoindian peoples within the Southern High Plains region. Camp sites are less visible compared to kill and butcher/processing sites and the Capshaw site stands to contribute to the overall understanding of Paleoindian social organization by providing a new perspective on a newly discovered site.

Greenwald, Alexandra (University of Utah)**[15]***Women's Time Allocation Trade-offs in an Intensive Foraging Economy Led to Future-Discounting Reproductive Behavior*

Population growth during the Medieval Climatic Anomaly (MCA) (1100–600 BP) and into the Late Period (~600–180 BP) in Central California drove increased intensification and reliance on low-ranking, low-risk food sources, primarily acorn and small seeds inland, and shellfish and small schooling fish on the bayshore. These foods rely disproportionately on the labor input of women to gather and process. This focus on foods reliant on intensive female labor, combined with well-documented declines in reproductive-aged women's foraging efficiency associated with the care of breastfeeding offspring, created high foraging opportunity costs for women. This time-allocation trade-off between foraging and direct parental investment may have incentivized earlier weaning ages during the Late Period. A high risk of shortfall led to future-discounting reproductive behavior such that, in an effort provide sufficient foraging returns at the household level, women inadvertently decreased their inter-birth intervals and increased their fertility, producing greater strain on the household economy. Therefore, although high extrinsic mortality conditions associated with the MCA abated around 600 BP, the shift in life history strategies to a risk-averse quantity over quality approach during the MCA precipitated a cycle of population growth and intensification that extended into the Late Period, driven by women's time-allocation trade-offs.

Greenwald, Alexandra [61] see Martinez, Marcos

Greenwald, David (Jornada Research Institute)

[136]

Tularosa Canyon Great Kivas: Implications of Their Orientations with Respect to Solstice and Equinox Alignments

Recent investigations at the Creekside Village and Twin Kivas irrigation communities have noted associations of kiva orientations with solstice sunrise and equinox shadow castings that require consideration that these public architectural features were placed on the landscape to specifically mark yearly events, in addition to their broader social, political and ritual uses. This paper examines and discusses structure associations with solar events on the surrounding landscape, observations that have been made over the past five years. Such associations may be definable in association with other great kivas from across the Southwest from which implications may be drawn through general observations and viewshed analyses.

Greer, John [56] see Greer, Mavis

Greer, Mavis (Greer Archeology) and John Greer (Greer Archeology)

[56]

Dr. Lynn Fredlund, Archaeologist of the Northwestern Plains

Lynn Fredlund was a product of the 1960s, the decade before women exploded onto the archeological scene on the Northern Plains. She was one of the earliest archeologists to earn her living as a contract archeologist, and one of the first in the region to earn a PhD while actively pursuing a career that involved intensive fieldwork followed by intensive, time-sensitive report writing. Her work on large-scale survey projects in Montana brought her to the forefront of lithic studies, and her work with rock art recording and analysis was ahead of the boom in these studies that began in the 1990s. Records of the region, mostly available in reports and site forms, reflect her career of data accumulation on Plains cultures, but she also reached the public and peers with publications. She was an ordinary archeologist who gathered an extraordinary amount of information on Plains archeology.

Greer, Sean [261] see Bullion, Elissa

Gregorio de Souza, Jonas (Universitat Pompeu Fabra)

[4]

Modeling Late Holocene Diasporas in South America: Spatial Analyses of the Radiocarbon Record and Simulation Approaches

During the late Holocene, lowland South America was home to remarkable cultural expansions marking the introduction of ceramic technology, more permanent settlements, and polyculture agroforestry throughout the neotropics. Some expansions (e.g., Saladoid-Barrancoid, Incised-Punctate, Tupiguarani) have been associated with widespread language families, rivalling similar cases of farming-language dispersals in other continents. Nevertheless, well-informed models of the timing, pace and routes of archaeological expansions in lowland South America, as well as the underlying mechanisms (demographic growth, diffusion, independent adoption) remain underexplored. In this paper, I present spatial analyses based on a radiocarbon database with over 2500 records pertaining to late Holocene lowland South American archaeological traditions. I focus on (1) geostatistical approaches to identify potential origins and rates of dispersal; and (2) computational models simulating dispersals under different population densities, growth rates, fission dynamics, among other variables, with the aim of finding the parameters that best fit the empirical radiocarbon record.

Gregory, Andrea (MCX CMAC, U.S. Army Corps of Engineers)

[132]

Discussant

[132]

Chair

Gregory, Andrea [132] see Buller, Justin

Gregory, Andrea [132] see Joseph, J.

Gregory, Teresa (Statistical Research Inc.)**[52]***Arizona's Plan for Tracking, Organizing, and Storing Federally Protected Cultural Resource Management Data to Ensure Mission Readiness*

The Arizona Army National Guard (AZARNG) is developing a system to more effectively manage cultural resource data. Agency archaeologists and CRM firms conduct surveys and excavations as required under Section 110 and/or Section 106, produce reports, and gather geographic information systems (GIS) data that will benefit from proper tracking, organizing and storing for efficient retrieval. The current data will be completed with a field collection application (Survey 123) to facilitate the seamless flow of data into a single comprehensive geodatabase (GDB). The GDB will store information on cultural resources, natural resources, environmental, remediation, and infrastructure. A GIS Viewer (based on ESRI ArcGIS Pro) will provide easy, controlled access to these data for archaeologists and AZARNG project managers. ESRI Workflow Manager will be used to track the overall project workflow. Arizona has been planning and building this system for several years and will be using it by the end of 2019. Proper training is required for AZARNG personnel and quality control/quality assurance will be overseen by trained professionals. A full-time GIS manager will be required upon completion. Documents will be stored in a central archive with a catalog kiosk. The ultimate goal is improved mission readiness.

Gregory, Timothy [36] see Kardulias, Paul Nick

Grell, Jessyka and Nicholas Herrmann**[215]***An Analysis of an Unmarked Cemetery Geophysical Methods in Sint Eustatius*

This study assesses the extent of an unmarked cemetery associated with the Lazaretto (1866–1923) on the Dutch Caribbean island of Sint Eustatius (Statia) using geophysical methods. The Lazaretto was a poor house and leprosy hospital established to serve patients from Statia and nearby Saba. Ground penetrating radar (GPR) and fluxgate gradiometer was employed to scan the area around the old hospital. Prior excavations west of the Lazaretto building by Gilmore (2004) identified a series of five burials in two rows. The 2019 survey grids are combined with GPR data collected in 2017 to produce a composite block that encompasses the 2004 excavations and previously uninvestigated areas. The combined GPR and shallow surface gradiometer data indicate a series of distinct burial anomalies that align with the burials excavated in 2004 and suggest additional interments within the unmarked cemetery. In addition to verifying the position of known burials and identifying more graves, the data is processed for the relative depths and orientation of the graves relative to the burials excavated in 2004.

Grenda, Donn (Statistical Research Inc.) and Karen Swope (Statistical Research Inc.)**[247]***Redlands Chinatown and Barrio Archaeological Project: Overview, Challenges, and Opportunities*

This paper introduces Statistical Research, Inc.'s (SRI) downtown Redlands archaeological project that focused on Chinatown and a Mexican barrio located along the railroad tracks. SRI excavated nearly 6 acres and recovered hundreds of features (e.g., trash pits, privies, foundations) representing the 1880s through the 1960s. Much of Redlands' history focuses on wealthy easterners that founded the City, owned the businesses, and built mansions in the hills. This project provided a unique window into ethnic communities that supplied the workforce for the railroads, orange groves, packinghouses, and associated industries that drove the Redlands economy prior to WWII. The residential communities were horizontally stratified due to the expanding industrial district that, over time, pushed the housing areas out of downtown. The papers in this session examine how different ethnic groups adapted to discrimination, changing attitudes, and variable economic conditions from the founding of Redlands through its shift away from agriculture toward a more suburban residential community.

Grenda, Robert, Scott Sunell (Statistical Research Inc.) and Richard Ciolek-Torello (Statistical Research Inc.)**[247]***Privies, Pits, and Ovens in Downtown Redlands*

The Downtown Redlands Archaeological Project encompasses over 2.5 hectares of land distributed in four parcels at the historic center of Redlands, California. These parcels contain large portions of what were once the Chinatown and Mexican barrio areas of Redlands. Our investigations have resulted in the excavation of hundreds of archaeological features dating from the 1880s to the 1950s. While some of the features are surface trash scatters, the vast majority are discrete trash pits (domestic and industrial), many of which contain stratified deposits. The former type are widely distributed throughout the project area, while the latter are associated with the packing house and pipe works formerly located along what is now Eureka Street. In addition, over a dozen much deeper privy pits, as well as a few building foundations, outdoor ovens, and other features, have been excavated. Together the domestic features have yielded a wealth of information about the historical development of Redlands and, in particular, the lives and activities of the Chinese, Mexican, and other residents of this area. In this presentation, we describe the range of features identified and summarize key preliminary findings from artifact analyses concerning chronology, activities, diet, social status, and ethnicity of the area residents.

Grier, Colin (Washington State University)**[23]***Persistence and Continuity in the Holocene History of the Northwest Coast of North America*

The term Archaic has had limited currency on the Northwest Coast despite being utilized in the 1999 master chronology advanced by Ames and Maschner. Subsuming diverse local monikers, they define it as "the time period between the late Pleistocene and the rise of more permanent settlement, resource intensification, and changes in social organization." This implies Archaic peoples can

be characterized by what they lack—the complexity attributed to later Northwest Coast peoples. More recent perspectives and data from the Northwest Coast emphasize continuity rather than transformations toward complexity, stemming from data that illustrate persistence of place, temporally extensive villages, long-term landscape management practices, and investments in monumentality. Given this, I consider how we might productively remobilize the concept of an Archaic on the Northwest Coast, following similar projects recently undertaken in other regions with complex hunter-gatherer-fisher groups. I also reevaluate the idea of the Archaic as somehow pre-agricultural, in that Northwest Coast peoples clearly embraced a range of socioecological practices typically deemed agricultural. In these respects, reevaluating the Archaic is about downplaying periodization and differences in favor of contemplating a more seamless and continuous past.

Grieve, Jeffrey [64] see Hodgetts, Lisa

Griffith, Cameron (Texas Tech University)

[137]

Speleoarchaeological Reconnaissance in the Periphery of Copán

In 1896–1897, George Byron Gordon investigated a series of caves in the Sesesmil River Valley of Honduras, north of the city center of Copán. Gordon's expedition is understood to be the first archaeological exploration of caves in the region, yielding numerous artifacts as well as evidence for a plethora of different mortuary practices. Since Gordon's day there have been at least five different official scientific investigations of caves in the vicinity of Copán, in addition to numerous unofficial visits/explorations, including looting activity and resource procurement. In July 2018, as part of the Proyecto Arqueológico Río Amarillo, Copán, a handful of caves around Copán were revisited yet again. This reconnaissance and reassessment endeavor yielded additional information about the use of subterranean space by ancient Copáneros, and shed new light on the artistic phenomenon known as Monumental Modified Speleothem Sculpture (MMSS). In this presentation I present some of these recent findings, which enhance our burgeoning knowledge base for this still relatively obscure ancient Maya art genre.

Griffith, Timothy, Charles Frederick (Geoarchaeological Consultant) and Joel Butler

[198]

Geoarchaeology at the Headwaters on the Comal River, New Braunfels, Texas

Situated at the head of the largest Spring system in Texas and fifth largest in the United States, it is not surprising that 41CM204 has a long and complex occupational history. Situated on Blieders Creek close to where it emerges from bedrock confinement into the Guadalupe River Valley, the site is thought to have experienced deposition from both streams during the Holocene. This paper presents information on the stratigraphic framework of the site deposits and how sedimentation rate has conditioned the presentation of the occupational sequence.

Griffith, Timothy [194] see Lassen, Robert

Griffith, Timothy [176] see Seikel, Katherine

Griffiths, Seren (University of Central Lancashire)

[146]

Cataclysmic Events, Long-Term Processes, and Human Responses: Identifying Causal Relationships in Holocene Human-Environment Interaction

Human societies are always to some degree resilient to environmental change. However, cataclysmic weather events, and the results of long-term processes of climate change undoubtedly contribute negatively to human survival. Central to understanding the impacts of such events and processes must be robust and precise chronologies of both indicators of human activity and paleoenvironmental events and processes of change. The extent of environmental impact on human survival has been a significant theme in the development of archaeological thought, however, recently, with significant advances in our abilities to produce robust chronologies (such as chronological modeling using OxCal) and to recover and interpret paleoenvironmental proxies (such as submarine sequences, and plant and animal aDNA studies), we have the potential to significantly revise our interpretations. This paper will present a range of case studies from Holocene Europe, including sea-level change, proxies for human populations, and palaeoenvironmental "events" to discuss the challenges in narrative construction using these new methods.

Griffy, Henry [226] see McCorriston, Joy

Grillo, Katherine [171] see Hildebrand, Elisabeth

Grimes, Vaughan (Memorial University), Deirdre Fulton (Baylor University), James Fulton (Baylor University), Davide Zori (Baylor University) and Colleen Zori (Baylor University)

[51]

Preliminary Isotope Evidence for Animal Husbandry and Transhumance during the Medieval Period at the San Giuliano Acropolis, Italy

The San Giuliano Archaeological Research Project (SGARP) offers an excellent opportunity to investigate potential diachronic changes in human-animal interactions from the Roman to Late Medieval periods in central Italy. Here we report on our initial faunal and plant isotope data ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$, $\delta^{18}\text{O}$, and $87\text{Sr}/86\text{Sr}$) from the medieval acropolis on the San Giuliano plateau and the development of a local 'isotope'. Combining these data with existing baseline isotope models for Italy, we explore issues of animal

transhumance, human land use, and subsistence patterns during the medieval period at San Giuliano. These results will be discussed in context with other archaeological evidence from the SGARP to better understand the human-animal experience at this site.

Grinnan, Joseph [18] see Delgado, James

Griswold, William [188] see Humphreys, Stephen

Grizzle, Meghan (Denver Museum of Nature & Science)

[185]

Jones-Miller Bison Kill Site: What the Hell (Gap) is Happening Now?

Robert B. Jones, Jr., discovered the Jones-Miller Bison Kill Site (5YM8) in 1972; Dennis Stanford of the Smithsonian Institution led the excavation of the site in subsequent years. The site contains the bones of more than 300 Bison antiquus. It dates to roughly 8,000 BCE and is the only site in Colorado associated with the Hell Gap complex. The Denver Museum of Nature & Science (DMNS) recently took possession of the Jones-Miller Site collection after it had been loaned to the Smithsonian Institution for over four decades. DMNS staff are now actively engaged in organizing and cataloguing the collection and making it available to visiting researchers. The long-term goal is to publish a comprehensive report on the project and collection.

Grooms, Michael (University of New Mexico) and Norm Easton (Yukon College)

[198]

Geoarchaeology at the Little John Site (KdVo-6), Yukon Territory, Canada.

The Little John Site (KdVo-6), Yukon Territory, Canada, contains the presence of both Chindadn/Nenana and Denali artifacts in unique stratified contexts. The site contains loess/paleosol stratigraphic sequences spanning the past 14,000 years. Sediment and soil, XRD, INAA/ICP-MS, and thin section analysis have illuminated the chronology, environment, and depositional history of the site's unique geologic context and archaeological materials.

Grooms, Michael [202] see Sattler, Robert

Grooms, Seth (Washington University, St. Louis)

[146]

Mound Building at Jaketown: Sacred Ballast on a Volatile Landscape

Mound building began almost 7,000 years ago in the Lower Mississippi Valley (LMV), and it represents the oldest earthworks in North America. This Native mound building tradition manifests itself at the Jaketown site in west-central Mississippi in the form of dozens of mounds. At Jaketown, mound building began during the Late Archaic period and the era of Poverty Point culture, and it continued through the late precontact period. There were pauses in mound building at Jaketown over roughly 4,000 years of Native occupation. The most conspicuous hiatus lasted about 500 years, and it was likely caused by a catastrophic flood triggered by global climatic changes. However, Native people continued to build mounds at Jaketown. This paper is a case study of the resilience of mound building at Jaketown in the face of detrimental climatic changes.

Gross, Kendyll [109] see Granados, Rosario

Grouard, Sandrine [252] see Perdikaris, Sophia

Grubb, Muriel (East Carolina University) and Charles Ewen (East Carolina University)

[3]

The Archaeology of the Social Safety Net at the Pitt County Poor Farm

The Pitt County Poor Farm, also known as the Pitt County Home, was established in the early nineteenth century to feed and house the local poor population of Pitt County, North Carolina, prior to the establishment of the federal welfare system. The farm was continuously occupied and reorganized several times before it was closed in 1965. Three seasons of archaeological work on the site have expanded the interpretation of what life in rural eastern North Carolina was like for this underprivileged, disenfranchised population. The findings from Pitt County can be compared to other contemporary poor farm and farmstead sites throughout the country to find similarities and differences in the living conditions of the poor during the nineteenth and early twentieth centuries.

Gruber, Janna [193] see Beach, Sonya

Gruber, Thomas [193] see Beach, Sonya

Gruhn, Ruth (University of Alberta)**[170]***Critical Remarks about Present Conceptions of the Initial Peopling of the Americas*

This long-term advocate of a pre-Clovis arrival into the Americas, although gratified by the collapse of the Clovis-first model, finds presently popular models of an initial entry only a few thousand years before the development of the Clovis phenomenon to be unsatisfactory, as evidence accumulates for an initial entry before the Last Glacial Maximum. It is time for yet another major change in our conception of the timing and character of the earliest peopling, and this paper will offer some ideas to consider.

Grund, Denay (University of Nevada, Reno)**[203]***Diachronic Variability in Obsidian Use in Hawksy Walksy Valley, Oregon*

Hawksy Walksy Valley is a small pluvial lake basin in southeastern Oregon. It contains a rich record of human occupation spanning the past 13,000 years. For the past two summers, crews from the University of Nevada, Reno's Great Basin Paleoindian Research Unit (GBPRU) recorded thousands of obsidian tools in the basin, including hundreds of projectile points that collectively represent the entire chronological sequence for the region. In this paper, I present the results of a pXRF analysis of those artifacts to understand when and from where visitors to Hawksy Walksy Valley obtained toolstone. I then compare the results to recent similar studies from adjacent valleys to situate Hawksy Walksy Valley within the broader context of northern Great Basin prehistory.

Grussing, Valerie**[116]***Moderator***Gruver, Steph (University of Florida), Kurt Rademaker (Michigan State University) and Matthieu Carré (La Universidad Peruana Cayetano Heredia)****[67]***Andean Hunter-Gatherers Occupational Patterns and Responses to Environmental Changes*

Quebrada Jaguay 280 (QJ-280) is one of the earliest maritime archaeological sites in Peru. Located on the southern coast, QJ-280 was inhabited by hunter-gatherers from ~12,000–8,000 cal yr BP, from the Terminal Pleistocene to the Middle Holocene. Excavations conducted in the 1990's and 2017 recovered high volumes of marine faunal remains, particularly those of the mollusk, *Mesodesma donacium*. The ubiquitous species accounted for ~99% of the sites shell assemblage. An isotopic examination of the *M. donacium* remains allowed for a reconstruction of the occupational seasonality of QJ-280 as well as of the paleoenvironmental conditions experienced by its inhabitants. Results of the isotopic analysis indicated that QJ-280 was seasonally occupied during the austral summer, primarily during the months of February and March. Data suggests that the lengths of habitation potentially doubled from the Terminal Pleistocene to the Early Holocene, from four to eight weeks. The paleoenvironmental reconstruction led to the identification of a Terminal Pleistocene-aged El Niño event that was directly associated with an anomalous October occupation. The isotopic examination of *M. donacium* remains from QJ-280 suggest that early hunter-gatherers likely modified their occupational patterns to adapt to long-term climate change and periods of environmental instability.

Gu, Wanfa [45] see Zhai, Shaodong

Guderjan, Thomas (University of Texas, Tyler), Joshua Kwoka (University of Buffalo) and Colleen Hanratty (University of Texas, Tyler)**[230]***Lidar Reveals Stone Boundary Markers Surrounding Ancient Maya Houselots and Neighborhoods in Belize*

The study of Maya household archaeology has always been hindered by insecurity in our knowledge of houselots' spatial boundaries. Recently, aerial lidar has revealed a complex of linear stone features bounding houselots at the Maya site of Xnoha. Xnoha's central precinct includes a large pyramid-plaza complex with a nearby hilltop acropolis complex and royal Early Classic stucco masks on two buildings. The central precinct of Xnoha is surrounded by four large hilltop neighborhoods with houselots bounded by linear stone markers. We discuss the importance of this discovery to studies of Maya households and neighborhoods.

[230]*Discussant*

Guderjan, Thomas [230] see Kwoka, Joshua

Guðmundsdóttir, Lísabet (University of Iceland)**[50]***Driftwood, a Lifeline in the Arctic: Production of Artifacts from Driftwood in NW Iceland and Norse Greenland*

Iceland was settled by the Norse in the late ninth century and Greenland was settled from Iceland around 1000 AD. Although these countries are quite dissimilar in landscape and geology, they have a similar flora in which the only forest forming tree is birch. Birch alone could not sustain the wood demands of these Norse colonies for prolonged periods of time, but Icelanders and Greenlanders had another wood resource available to them—driftwood. This wood originates in the boreal forests of Russia/Siberia and North America, where trees fall from eroding riverbanks into rivers that carry the driftwood into the Arctic Ocean. In Iceland, one of the most driftwood-rich areas is Strandir in the northwestern fjords. Here, in the recent past, there was a strong woodworking tradition with a level of craft specialization that produced highly sought-after artifacts, furniture and boats. Not as much is known about the

woodworking tradition in Norse Greenland, but recent archaeological research on wooden objects suggests that here, too, driftwood was a very important resource exploited by skilled craftspeople. In this presentation I will discuss literary sources about wood utilization in Strandir and how they can be compared to the archaeological material from Norse Greenland.

Guebard, Matthew [135] see Kessler, Nicholas

Guengerich, Anna [6] see Pratt, Lauren

Guérin, Guillaume [36] see Holliday, Trenton

Guernsey, Julia (University of Texas, Austin)
[191]
Discussant

Guerra, Rafael [178] see Ellis, Olivia

Guillaume, Porraz [11] see Giulia, Ricci

Guimarães Melo, Lana Gabriela [161] see Rocha, Bruna

Guinard, Michel (Societas Archaeologica Upsaliensis)
[250]

Excavations and Surveys at Caimane Cave and in the Gaza Region, Mozambique

Compared to the neighboring countries archaeological projects are rare in Mozambique. Not much is known of the local chronology, neither during Stone Age or Iron Age, in the area. The Caimane cave, situated in the south-west of Mozambique, has since the early eighties been excavated several times. The collected material from the cave have a chronological span ranging from the Iron Age to MSA. Sadly, no results from these projects has been published. This paper will present some preliminary results from the former excavations and also results from the season 2019. During the field season 2019 not only a new part of the cave was in focus but also surveying for open air sites in the adjacent area. The preliminary results from the Caimane project will be put into context with extensive surveys conducted in the Gaza province in Mozambique during 2015. Here material was systematically collected around water holes (or pans) and along river banks, in addition with some digging of test pits.

Guiry, Eric (Trent University), Stéphane Noël (Service de la culture, du patrimoine et des relati), John Fowler (Saint Mary's University) and Susan deFrance (University of Florida)
[76]

Quantifying the Role of Salt Marshes in Animal Husbandry: Stable Carbon and Sulfur Isotope Insights

Coastal environments, and salt marshes in particular, have played a major role in shaping human culture at a global scale, particularly with respect to providing richer pasture and fodder for livestock. Here we explore the stable carbon, sulfur, and nitrogen isotopic compositions of livestock ($n = 219$) bone collagen as a means of quantifying the extent to which salt marshes were used to raise cattle and sheep in coastal regions of seventeenth-to-eighteenth-century maritime Canada and southern Louisiana, USA. Animals (and humans) that rely heavily on salt marsh resources should have distinctive stable carbon and sulfur isotopic compositions due to the distinctive biology of key salt marsh grasses, particularly *Spartina* spp. (i.e., C_4 photosynthetic pathway; ability to use sulfide). Results provide the first quantitative insights into the importance of salt marshes in some of North America's earliest colonial agricultural systems. Because successful animal husbandry is a key variable in understanding how and why early New World settlements succeeded or failed, our findings provide a novel way of thinking about colonial subsistence and economic strategies. This approach to exploring the importance of coastal marsh use could also be applicable to much earlier archaeological contexts and in other areas of the world.

Gulley, William [142] see Stewart, Caitlin

Gulli, Domenica [196] see Levi, Sara

Gunchinsuren, Biambaa [175] see Gillam, J. Christopher

Gunn, Christopher (Kentucky Heritage Council)
[178]

Slate Ware Development in the Northern Maya Lowlands during the Late and Terminal Classic Periods

Slate wares are the predominant slipped ceramics of the later Classic period of the northern Maya Lowlands. Initial application of the type-variety classificatory scheme to northern ceramics divided slate wares into the Terminal Classic Cehpech complex and Early Postclassic Sotuta complex. All non-Sotuta slate ware variability was, thus, subsumed within a single cultural-temporal category. Uncritical application of the Cehpech concept to other ceramic complexes diminished the development of northern chronological sequences and significantly diminished a primary means through which to perceive cultural process. This is especially problematic for understanding the later prehistory of the Puuc Region, as its florescence and decline was thought to be encapsulated in a single cultural-historical unit. This research presents the results of a detailed analysis of slate ware composition and form traits from the eastern Puuc site of Kiuic. The stratigraphic relationship among slate ware traits and supporting evidence from the site's architectural sequence and chronometric data shows that slate ware use spans the Late and Terminal Classic periods (600–1000 AD). At Kiuic, slate wares form parts of at least two ceramic complexes. These results are synthesized with contemporaneous regional ceramic data to highlight local and regional trends in slate ware development.

Gunn, Joel (University of North Carolina-Greensboro)

[90]

Discussant

Gunn, Joel [168] see Folan, William

Guralnick, Robert [27] see LeFebvre, Michelle

Gush, Matthew (Photographer)

[77]

Visual Storytelling for a Modern Age

In a visually obsessed world, many archaeologists have squandered the potential for effectively sharing the story of their research. This presentation focuses on the importance of integrating a content creator and utilizing modern image creation techniques to more effectively communicate the story of archaeology, while freeing the archaeologist to focus on their work. By utilizing cutting-edge technologies, such as drone imaging, and social media, such as Instagram, there are immense opportunities to create content in an engaging fashion, and share it with a limitless online audience. This engagement helps build understanding, excitement and awareness with the public, solidify community support, and assists with prospective funding opportunities.

Gusick, Amy (Natural History Museum of Los Angeles)

[238]

Chair

Gusick, Amy [100] see Napolitano, Matthew

Gustas, Robert (University of Victoria) and Iain McKechnie (University of Victoria)

[271]

Past Kelp Habitats and the Peopling of the Americas

The history of early peoples in the Americas is a topic of perpetual interest to many archaeologists. Understanding how coastal environments have changed over the last +15,000 years provides insight into where and how early peoples lived in newly emerging landscapes. Using an existing abiotic Geographic Information System (GIS) model we have created preliminary predictions about the locations of modern and late Pleistocene kelp forests at five different locations on the Northwest Coast of British Columbia. These study areas include Barkley Sound on Vancouver Island, Quadra Island, Juan Perez Sound on Haida Gwaii, Calvert Island, and the Dundas Islands. Comparison of these locations shows substantial differences in the size and range of modern and past kelp forests. The study areas with greater sea level change over the last 15,000 years show more change in forest location in comparison to modern forests. In contrast mainland coastal sites show consistent habitat extent between time periods. Additionally, coast wide the total area of kelp forests has significantly changed resulting in significant reorganization of offshore subsistence resources. Better understandings of the history of these marine resources can help archaeologists to understand the lifeways of coastal peoples in the Americas.

Gutierrez, Gerardo [150] see Jurado, Erik

Gutiérrez, Maria [72] see Herr, Sarah

Guzman Piedrasanta, Melvin Rodrigo (University of Central Florida)

[155]

Discussant

Gyucha, Attila (Field Museum of Natural History), William Parkinson (Field Museum of Natural History), Richard Yerkes (Ohio State University), Danielle Riebe (University of Illinois, Chicago) and William Ridge (University of Illinois, Chicago)
[199]

Investigating the Evolution of Large Prehistoric Settlements: A Case Study from Szeghalom-Kovácsshalom

Archaeologists studying the evolution of large settlements face significant methodological challenges related to the size and complex occupational history of the sites. Although noninvasive field techniques are routinely applied these days, investigations into the spatial and temporal development of large sites still rely heavily on information that can only be collected through lengthy and expensive excavations. In this paper, we discuss a cost- and time-efficient field approach to study the diachronic development of large settlements through a case study of a large Late Neolithic village in Southeast Hungary. At Szeghalom-Kovácsshalom, extensive magnetic surveys produced a palimpsest of archaeological features, including about 170 buildings that reflect the development of the settlement over several hundred years. We paired the magnetic data with minimally destructive, targeted excavations and coring of more than 20 structures across the site to explore the nature, time, and length of their occupation through stratigraphic analysis and absolute dating. In a very short time and with a small professional crew, we gained a refined understanding of the evolution of the Szeghalom-Kovácsshalom village. The results also have fundamentally influenced our understanding of regional-scale demographic processes that led to the formation of similar nucleated centers during the Late Neolithic.

Haas, Jennifer

[74]

Woodland Tradition Plant Use and Foodways in the Western Great Lakes: A View from Southeastern Wisconsin

This paper reports a multi-proxy approach to Woodland foodways, integrating plant macrobotanical studies, faunal analyses, ceramic morphological and use wear analyses, and absorbed residue analyses. By using the concept of foodways, diet and subsistence are contextualized within a broader framework of cooking and food preparation practices. Datasets from southeastern Wisconsin and the surrounding region highlight diachronic trends of wild resource procurement, processing, and consumption. In southeastern Wisconsin, foodway data suggest that Early and Middle Woodland populations were seasonally mobile foragers reliant on a variety of wild plants and animals with limited use of domestic cultigens. Late Woodland contexts have yielded evidence of domestic and tropical cultigens, as well as nuts and wild seeds. Recent analysis of Finch site (47JE0902) data have yielded a wealth of information regarding Woodland Tradition foodways owing to the recovery of well-preserved plant macrobotanical and animal remains, as well as associated ceramics. Results suggest that culinary traditions of Early and Middle Woodland groups in southeastern Wisconsin were broadly similar, although a greater emphasis on mast crop exploitation is evident during Middle Woodland times. Maize does not appear to be present prior to the late tenth century but becomes ubiquitous in Late Woodland times.

Haas, Randall [180] see Chen, Jennifer

Haas, Randy [233] see Noe, Sarah

Habu, Junko (University of California, Berkeley), Yumiko Ito (Cultural Properties Protection Division), Anna Nielsen (University of California, Berkeley) and Sandra Oseguera Sotomayor

[235]

Contributions of Mountain Food Resources to Jomon Subsistence and Landscape Practices

This paper evaluates the importance of mountain food resources among prehistoric hunter-gatherers of the Early and Middle Jomon periods in the northern Tohoku region, Japan (ca. 6000–4500 cal BP). Recent molecular and isotopic investigations of pottery highlight the possible importance of marine food at several Incipient, Initial and Early Jomon sites. Results of archaeobotanical analyses and stable isotopic analyses of human skeletal remains, however, indicate that residents of Early-Final Jomon sites in northeastern Honshu, including northern Tohoku, were likely heavily reliant on starchy foods from the forest, including chestnuts, acorns and buckeyes. To further investigate these issues, this paper examines archaeological data from two Early-Middle Jomon sites, Goshizawa Matsumori in Aomori Prefecture and the Goshono site in Iwate Prefecture, and interprets the results in the context of continuity and change in landscape practices in this region. Methodologically, the paper emphasizes the significance of floating soil samples from non-waterlogged Jomon sites. Potential contributions of ethnographic and ethnoarchaeological studies in this region to Jomon archaeology, including those on the resilience of food systems, craft production and seasonal subsistence cycles, are also discussed.

Hackenberger, Steven [8] see Brown, James

Hadden, Carla (Center for Applied Isotope Studies, UGA) and Suzanne Pilaar Birch (University of Georgia)

[27]

Trends in Research Funding for Women in Zooarchaeology

A 2014 survey revealed that women outnumber men in the field of zooarchaeology, and that a higher proportion of women are based in technician or research-only positions that tend to dedicate more time to faunal analysis but are also associated with lower pay rates and perceived status. Here, we describe gendered trends in the number, size, and type of awards granted for zooarchaeological research over time based on data from the National Science Foundation award database. We found that NSF funding for women in zooarchaeology reached an all-time high in 2019, but in most years, men receive more and larger awards than women. Based on the findings of the SAA Task Force on Gender Disparities in Archaeological Grant Submissions, differences in

(re)submission rates between men and women likely contribute to the under-representation of women PIs in zooarchaeology. The underlying causes of gender disparities in zooarchaeology are complex, and the funding gap represents both an opportunity and an obstacle for women in the discipline. Text analysis of successful proposals reveals patterns in the kinds of projects that are being funded by various NSF programs. We hope women in zooarchaeology will use this information to identify funding opportunities for their own research.

Hadley, Alison (Texas A&M International University)

[264]

Pawnee Myths and the Materiality of Childhood

This paper explores the use of myths as a tool for identifying and interpreting artifacts. Excavations conducted at a late eighteenth century Pawnee village site (14RP1) in north-central Kansas uncovered multiple clay, quadruped figurines. These artifacts closely resemble those that have been found at historic village sites across the Plains, including the Pike-Pawnee Village or Hill site (25WT1), the Longest site (34JF1), Like-A-Fishhook Village (32ML2), and the Leavenworth site (39CO9). Figurines are not recorded in the significant body of ethnographic and ethnohistoric literature on historic Pawnee lifeways. Interpretations of the Pawnee figurines were aided by Pawnee mythology, particularly boy hero myths, such as "The Boy and the Mud Pony". The myth reveals the use of horse figurines as children's toys. Myths and folktales are useful in archaeological interpretation because embedded in these stories of the supernatural are facts about the world. Other boy hero myths were analyzed for additional insight into the archaeological context of children.

Haffner, Jacob (University of Oklahoma), Hannah Mattson (University of New Mexico), Laura-Isobel McCall (University of Oklahoma) and Cecil Lewis Jr. (University of Oklahoma)

[244]

Archaeological Metabolomics: Residue Analysis and Mass Spectrometry

Residue analysis studies in archaeology often utilize mass spectrometry (MS) to characterize biomarkers within samples. Biomarkers are natural molecules whose presence in residues provide information about past human activity and geographic origin. An example is nicotine, whose identification would suggest an artifact was involved with processing and/or use of tobacco. These MS-based methods are increasingly common for archaeological analyses of organic residue, but they were developed for and are commonplace in fields like metabolomics and proteomics. However, such methods in archaeological studies are often outsourced to collaborators who specialize in MS research. This frequently results in methods that are vague, lack detail necessary for reproducibility, and minimally discuss data processing. Our exploration discovered only four residue-based archaeological publications met the standards expected from MS-based publications. We believe this is an understandable oversight as archaeologists, ancient biomolecule researchers, and MS specialists do not regularly discuss their fields' norms, perspectives, and methods. Moreover, we are discovering the compelling informative power of non-DNA biomolecules, but their significance has not yet been fully conveyed to other fields. We hope this poster serves as a step toward communicating standards between archaeology, ancient biomolecule studies, and MS research and further integrate information between fields.

Hagan, Elizabeth [36] see Durham, Jordan

Haichao, Li (Department of Archaeology, Sichuan University)

[45]

Preliminary Study of the Bronze Production in the Western Zhou Dynasty

This work involved archaeological study as well as scientific analysis to rebuild the bronze production system in the Western Zhou Dynasty. A systematic archaeological classification based on typology, motifs, inscriptions, casting techniques was established first. Yejiashan cemetery is used as an example here. The bronzes were classified into two categories: high quality ones (mostly Central Plains style) and low quality ones (mostly local style). Systematic scientific study was then carried out. Based on the 'Copper Groups' method proposed in the 'Oxford system', 'high quality' bronzes were produced with different materials from the 'low quality' ones. Moreover, the 'high quality' bronze in Jin marquis cemetery and Zhouyuan site were also made from the same material used in Yejiashan 'high quality' bronze. It suggests that most 'high quality' bronzes from different vassal states might originate from the same workshops. On the other hand, the 'low quality' local style bronzes in Yejiashan were made locally. Similar examples can be seen in other vassal states. The uniform production and distribution of 'high quality' bronzes and local production of 'low quality' bronzes were the two aspects of the Western Zhou Dynasty. This can be further supported by other archaeological evidences.

Halcrow, Sian (University of Otago, New Zealand)

[91]

Discussant

Halcrow, Sian [199] see Adams, Alisha

Hale, Nathan, Jessica Cook Hale (Emory University), Katherine Woo (University of Sydney), Jonathan Benjamin (Flinders University) and Ervan Garrison (University of Georgia)

[18]

The Geoarchaeology and Taphonomy of Submerged Shellfish Middens in Apalachee Bay, Florida, USA

Ongoing work at Econfinia Channel in Apalachee Bay, Florida, continues to reveal new submerged shellfish midden deposits. This is especially evident after the passage of tropical storm systems. The site preservation and exposures leading to discovery are

therefore comparable to other submerged archaeological sites around the world. However, shellfish middens may be especially resilient during and after submergence. A new study examines these characteristics. We consider submerged taphonomy and preservation in the context of marine conditions during and after submergence and suggest how these impact site formation and preservation in various environmental contexts.

Haley, Cambria (Wichita State University) and Crystal Dozier (Wichita State University)
[198]

An Assessment and New Survey of Boxed Springs (41UR30)

This presentation will cover the history of archaeological work at the Boxed Spring site (41UR30), a presumed Early Caddo mound site in east Texas. The site has a long history of avocational investigation, with the first professional archaeological survey completed in 2010 on the eastern half of the site. A preliminary survey was done by Wichita State University on the western half of the site in 2019. The results of this new survey and further studies of the site will be discussed.

Halffman, Carrin [202] see Sattler, Robert

Hall, Maximilian [187] see Reid, Amy

Hall, Molly [170] see Horn, Marty

Hall, Sarah (Arizona State University), Claudia Rojas Sepulveda (Department of Anthropology) and Kelly Knudson (Center for Bioarchaeological Research)
[134]

Life, After Life: Embodied Structural Violence in a Historic Skeletal Assemblage from Bogota, Colombia

Historic-era skeletal samples often reflect vulnerable populations and provide a unique opportunity to explore marginalized identities in the bioarchaeological record within a historically known context. This study uses historic, osteological, and biogeochemical data from a nineteenth and early twentieth century skeletal assemblage (MNI = 20) from the pauper section of Cementerio Central in Bogotá, Colombia to discuss the marginalized social identities of the individuals within the assemblage. Embodiment and postmortem agency frame this discussion to emphasize that living tissues reflect environmental stimuli within a given cultural context, and that cultural context persists after death. Skeletally, this can appear as evidence of stress, trauma, and migration, and can be reflected in mortuary treatment and taphonomic processes. Here, we recognize that social identity and biocultural context form a feedback loop, as each affects the other, both in life and in death. This context at Cementerio Central is historically documented, therefore structural violence theory can be used to understand the institutional forces that contributed to migration and poor health in life and to mortuary treatment and taphonomic damage in death.

Halligan, Jessi (Florida State University)
[219]

Discussant

Halligan, Jessi (Florida State University)
[238]

Where Is the Waterline? Integrating Terrestrial and Underwater Investigations in the Aucilla River, Florida

Over the past decade, research in the Aucilla River of northwestern Florida has focused upon understanding the geoarchaeological context of numerous formerly terrestrial, now inundated sinkhole spring sites and the landscapes surrounding them. Dozens of terminal Pleistocene and early Holocene-aged diagnostic artifacts have been recovered from this river, some in association with drowned terrestrial soils and intact dateable stratigraphy. Currently terrestrial sites of the same age have thus far proven undateable and are often conflated and deflated. The wealth of paleoenvironmental proxy data recovered from the drowned landscapes can help to explicate where, why, and how some sites have preserved while others have not and suggest how people were adjusting to their changing environments over the more than 14,000 years they have been occupying the Aucilla River basin.

Halling, Christine (Louisiana Department of Justice) and Ryan Seidemann (Louisiana Department of Justice)
[80]

Unidentified Oddity of the Petrous Portion of the Temporal Bone: A Case Study from a Historic Cemetery in Louisiana

While there are several commonly tracked non-metric and pathological features of the temporal bone, rarely are they found on the internal petrous portion. In this case study, the bilateral presentation of perforations located on the internal, superior aspect of the petrous portion of the temporal bone are discussed. The lesions are laterally placed near to the squama of the temporal bone rather than to the medial portion of the petrous. The perforations appear to manifest as wide porous lesions, each approximately 5mm x 15mm in size, superior to the auditory canal. Several conditions will be considered in completing the differential diagnosis including otitis media, cholesteatoma, brain herniation, and other osteolytic processes. There are no other obvious pathological conditions afflicting this individual. With an undetermined skeletal defect such as this, tremendous value is placed on the experience of other bioarchaeologists, and we welcome the opportunity for others to provide input and their own interpretation of the defect.

Halling, Christine [248] see Seidemann, Ryan

Halperin, Christina (Université de Montréal)**[54]***Ancient Maya Recycling: Economic Logics and Embedded Histories of Spolia and Reuse*

What are the basic principles of recycling among the ancient Maya? Arguably, recycling is a common economic behavior among all societies, ancient and contemporary alike. Yet how things are reused, by whom, and to what extent such practices are socially, economically, and politically embedded in a society's values varies over time and space. This paper examines recycling among the ancient Maya through the lens of architectural spolia and artifact reuse. It focuses, in particular, on whether the practices of using architectural spolia and refashioning ceramic sherds into new tools increased in frequency and social significance during the Terminal Classic period in the Southern Maya Lowlands, a period often associated with political crisis, shifting economic networks, and scarcity.

Halperin, Christina [168] see Le Moine, Jean-Baptiste

Hamdan, Leila [18] see Damour, Melanie

Hamilton, Andrew (The Art Institute of Chicago)**[109]***The Ethics of the Visible in the Visual Arts*

Art from the ancient Americas raises a host of ethical questions in so-called encyclopedic museums of art. One of the last geographic and cultural traditions to become exhibited as "Art," their entry was from certain points of view long overdue. Euro-American modern art in many ways opened the door as it redefined expectations for Art's visual appearance. But even with these changing expectations for the visual, the fundamental understanding of art's objecthood and how and why it was to be appreciated remained constant. To this day, objects in art museums, regardless of their cultural origins, are considered in largely Euro-American ways as things intended or expected to be appreciated visually—the visual arts—for their aesthetic, material, and technical qualities. But as these objects have entered art museums, so too have associated ancient and contemporary belief systems from these cultural traditions. How might these intellectual traditions re-shape understandings of art and objecthood? Who permits or performs that reshaping, and with what ethical consequences? And are the impacts of this relevant only to art from these traditions, or might they have consequences for how art, writ large, is viewed? Ultimately, what ethical considerations surround making something invisible?

Hamilton, Derek (Scottish Universities Environmental Research Centre) and Sophia Adams (Scottish Universities Environmental Research Centre)**[135]***Is La Tène Still Relevant in British Iron Age Chronology?*

La Tène: a chronology that lives beyond the site, beyond regional and national boundaries; a term that conjures images of swirling ambiguous imagery, fine metalwork and shining pots. In Britain the term describes artifacts of apparently comparative date, in particular brooches. La Tène I brooches have strong affinities with examples from the type site and on the near continent, while La Tène II brooches are often exceedingly different from their apparently contemporary counterparts in France, Belgium, Germany, and Switzerland. The proposed stylistic connections between regions have been used to create the chronology of these artifacts in Britain; organized into periods, bracketed by calendar years. In turn these stylistically dated brooches have been used as evidence to date features and sites. This paper uses radiocarbon dates obtained from human and animal remains found within close association to brooches to create an independent chronology that transcends geographical, temporal, and culture-historical boundaries, and can be compared back to the data from Continental Europe. It will also discuss the implications of research on existing chronological sequences and examine the issues of using La Tène typologies as the basis for constructing Bayesian models.

Hamilton, Derek [135] see Krus, Anthony

Hamilton, Marcus (University of Texas, San Antonio) and Briggs Buchanan (University of Tulsa)**[26]***The Complex Diversification of North American Projectile Point Typologies over Time and Space*

A central goal of complexity science is to understand how complex dynamics results in the diversity we observe in the world around us. The archaeological record demonstrates that prior to European colonization prehistoric North America was extremely diverse in terms of material culture. We also know that this diversity evolved rapidly over the course of only a few thousand years from a relatively homogenous ancestral population that arrived sometime in the late Pleistocene. On the one hand, each manifestation of cultural diversity could be the result of an entirely discrete, contingent, and self-contained set of mechanisms specific in time and place. On the other hand, the whole spatiotemporal spectrum of cultural diversity may be the result of a core set of interacting processes common in time and space but interacting with local phenomena and specific constraints. Here, we quantify the diversification of North American projectile point typologies over 13,000 years using scaling theory. By compiling time series of projectile point types and their spatial distribution, we show that projectile point diversification was a complex fractal-like space-filling process where diversification in time was also diversification in space. The underlying dynamics are simple, but their outcomes are complex.

Hamilton, Marcus [101] see Kilby, David

Hammerstedt, Scott (University of Oklahoma), Patrick Livingood (University of Oklahoma), Jami Lockhart (Arkansas Archeological Survey), Amanda Regnier (University of Oklahoma) and John Samuelsen (Arkansas Archeological Survey)
[107]

Multisensor Geophysical Survey at Spiro Mounds: Changing the Landscape

For much of the past decade, we have been conducting landscape-scale geophysical survey at Spiro Mounds, a large regionally important ceremonial center in eastern Oklahoma. The use of complementary instruments (gradiometry, electrical resistance, and GPR), combined with archival research and targeted excavations, has led to a new understanding of Spiro's history, specifically the identification of numerous temporary structures near the site's primary burial mound. In this paper, we re-contextualize Spiro based on this new information.

Hammerstedt, Scott [189] see Levine, Marc

Hammerstedt, Scott [222] see Livingood, Patrick

Hammond, Norman (Boston University)

[163]

Discussant

Hampton, Ashley (University of Montana) and Jesse Harvkey

[254]

With a Plus Five in Archaeology: Examining Representations of Cultural Heritage in Tabletop Role-playing Games

Public archaeology plays a vital role in popular perceptions about the past which is oftentimes at odds with pop culture manifestations of archaeologists (fictional figures like Indiana Jones or Lara Croft). Games may provide an avenue through which public archaeology can effectively present the past while tapping into popular media. However, to be productive it is not merely about creating games with an archaeology theme or games that focus on re-creating past histories. In order for gaming to effectively promote meaningful and personal interpretations of the past, I argue it is necessary for such games to either be structured around the "gamification" of archaeological knowledge and/or present such knowledge through experiential learning. Drawing on discussions of cultural heritage and popular culture, I look at how these two realms intersect to see how cultural heritage is reflected in—and reflects—popular culture and notions of the past. Tabletop role-playing games (TRPGs) are highly interactive, imaginative games that can productively combine gamification of archaeological knowledge with experiential/personal learning. By analyzing how such games present ideas about heritage and archaeology, we may get a better understanding of how the past (and those who work to understand it) may actually be perceived by diverse audiences.

Han, Ji-Wan [147] see Newell, Zachary

Hanna, Jonathan (Pennsylvania State University), Matthew Napolitano (University of Oregon), Robert DiNapoli (University of Oregon), Jessica Stone (University of Oregon) and Scott Fitzpatrick (University of Oregon)

[135]

Modeling Demographic Change in the Precolumbian Caribbean

A recent synthesis of radiocarbon dates in the Caribbean is indicative of two major population dispersals that correlate to the longstanding cultural divisions of the region's Archaic and Ceramic Ages. Using the most reliable dates from this dataset, we constructed both region-wide and more local sum probability distributions (SPD) for use as proxies of population fluctuations over time. We then juxtaposed these with the largest compilation of radiocarbon dates available from South America, along with several climate datasets and a volcanic record for the Caribbean. Comparison of these data provide support for the traditional divisions while offering new insights into separate migration events both within the Caribbean archipelago and between the South American mainland. Results suggest that there was a potential influx of peoples during the middle Early Ceramic period ca. AD 100–300, human-climate interactions at the start of the Late Ceramic period ca. AD 700, demographic shifts with the supposed arrival of "Island Caribs" ca. AD 1200, and a potential "depopulation" of some islands before European arrival several centuries later.

Hanna, Jonathan [60] see Hayward, Michele

Hanna, Jonathan [53] see Walling, Stanley

Hannold, Cynthia

[233]

Castings a Wide Net: Experimental Research with Columbia Plateau Net Sinker Types

The prevalence of net sinkers in Columbia Plateau sites reinforces ethnographic and archaeological evidence that points to the significance of fish, particularly salmon, and related subsistence activities in this culture area. Like other tools, net sinkers require careful thought and planning, from tool stone selection through methods for lithic reduction. Combining experimental methods to replicate several hundred net sinkers with an analysis of net sinkers in Clearwater River and Lower Snake River assemblages, the author examines net sinker manufacture in the Columbia Plateau. Research suggests that one factor driving net sinker type selection—grooved, perforated, notched et al.—is the workability of available raw material and that individual preferences, as much as regional ones, strongly influence the distribution of the net sinker types we see.

Hanratty, Colleen [230] see Guderjan, Thomas

Hanselka, Kevin [68] see Koenig, Charles
 Hanselka, Kevin [186] see Nielsen, Christina

Hanselmann, Frederick [18] see Horrell, Christopher

Hansen, Brooke [104] see Harrison, Laura

Hansen, Daniel (University of Chicago)

[234]

Rethinking "Ethnicity," Rethinking "Archaeology": Overcoming Epistemic Obstacles to the Study of Social Identity in the Past

Despite efforts toward more nuanced and ethnographically-grounded understandings, progress toward a viable archaeological approach to ethnicity has proved frustratingly unsuccessful. Some maintain that the methods of archaeology cannot access ethnicity at all, while others advocate for further inquiry into the relationships between archaeologically-observable phenomena and ethnic identity—while understanding that such traces can be deceiving. In this paper, I argue both of these ways of thinking are misled by a conception of ethnicity in which self-understanding is the essential criterion. While internal states are invisible to archaeologists, we often overlook the fact that they are equally inaccessible to individuals sharing the same social context; they must therefore be immaterial to both the social phenomenon and the study of ethnicity. It is more useful to understand ethnicity as a language game—a set of rules for talking about and ordering the world by observable criteria. In participating in this language game, we must recognize that archaeology is a dialogic practice engaged in tracing social difference. I will employ examples from recent debates on ethnicity in Celtic archaeology to illustrate the flaws in our current thinking as well as to provide examples of what a viable "archaeology of ethnicity" could be.

Hansen, Richard, Edgar Suyuc (Mirador Basin Project, FARES Foundation), Carlos Morales-Aguilar (Universite Sorbonne, Paris) and AnaBeatriz Balcarcel (Universidad de San Carlos, Guatemala)

[163]

Multidisciplinary Investigations in the Mirador Basin, Guatemala: New Insights into the Origins and Dynamics of Incipiente Maya Civilization

Multidisciplinary investigations in the Mirador Basin of northern Guatemala have provided a new perspective of the origins and dynamics of incipient Maya civilization, including data on settlement patterns, sampling strategies, demographic distributions, chronological evaluations, DNA and isotope analyses, geological studies, architectural formats, and formation of complex political, social, and economic structures. Incorporation of extensive lidar data combined with archaeological investigations at numerous sites on a regional basis have provided evidence of the process and formation of a complex state by the Middle Preclassic period (ca. 1000–400 BC), with an apogee during the early Late Preclassic period (ca. 300 BC). The transformations into state-level formations suggest that the initial impetus was due to agricultural intensification and population logistics that formed the need for administrative centralization and the formation of government, which, when combined with competitive ideologies and peer-polity interactions, allowed increasing sociopolitical complexity. The cultural and environmental sagas in the Basin had a lasting and profound impact on subsequent Maya social and economic structure and historical trajectories, and provide new theoretical and methodological avenues of research and can further elucidate Maya social process.

[163]

Discussant

[163]

Chair

Hansen, Richard [163] see Ensley, Ross

Hanson, Annalys (Emory University), Jessica Thompson (Yale University), Jessica Cerezo-Román (University of Oklahoma), Jay Stock (University of Western) and Elizabeth Gomani-Chindebvu (Malawi Department of Museums and Monuments)

[38]

Mortuary Practices of Later Stone Age Hunter-Gatherers in Northern Malawi

Later Stone Age (LSA) hunter-gatherer mortuary practices are poorly understood in south-central Africa. Tropical climate and acidic soils hinder preservation, bioturbation is prevalent, and research coverage is sparse. The site of Hora 1, in the Mzimba District of Malawi, provides a rare opportunity to examine diversity and continuity over time in mortuary practices. Two flexed adult burials of a male and female, recovered in 1950, were recently dated to ~9000 and ~8000 cal BP, respectively. A fragmentary adult skeleton, recovered in 2017–2018, represents an incomplete cremation dated to ~9500 cal BP. In 2019, two infant (neonate) skeletons were recovered below this incomplete cremation, and show further diversity in mortuary treatment. The first, a nearly-complete flexed burial, was missing lower limb, hand, and foot elements that cannot be explained through taphonomic or postdepositional processes. Review of the original 1950 report shows that the flexed adult female was missing the same elements. The second infant burial also showed signs of postmortem manipulation, with partially-articulated limbs recovered alongside the skull, rather than in anatomical position. Here we situate these five sets of remains within ethnographic and regional archaeological data, and evaluate the possibility of mortuary curation practices during the LSA of northern Malawi.

Hanson, John

[26]

Was Life in Larger Cities Less Fair?

Although it is a common assumption that an increase in group size is associated with the development of institutions for mediating between individual and wider groups, there has been surprisingly little discussion of the formal relationships between the sizes of cities and legal systems in the context of the Greek and Roman world. In this talk, I will attempt to shed some new light on these issues, focusing on basilicas (which are usually interpreted as commercial and legal structures). I will show that, although there is a relationship between them, it is very sublinear (i.e., doubling the former does not equate to doubling the latter). I will then pause to reflect on the implications of this result for our view of how much access ancient residents had to legal systems and what this suggests about overall levels of inequality.

Hanson, Kelsey (University of Arizona) and Nancy Odegaard (Arizona State Museum and University of Arizona)

[79]

Employing Complementary Noninvasive Techniques to Characterize Paint Recipe Diversity in the U.S. Southwest

The characterization of paint recipes requires knowledge of source locations, processing requirements, and application techniques—but it is a technology that remains largely unproblematized in archaeological research. Studies of painted media often rely upon visual characterization of color alone to approximate underlying compositions, without chemical confirmation. Assumptions like these mask potential technological diversity. A combination of complementary noninvasive techniques (optical microscopy, XRF, FTIR, and Raman spectroscopy) are employed to characterize paint recipes. This poster presents the results of preliminary analyses of a collection of over 500 paint and pigment samples from the Arizona State Museum recovered from across the U.S. Southwest—ranging from unprocessed pigment parent material to prepared paint cakes. Preliminary results reveal notable diversity in paint recipes, reflecting differences in paint constituents, processing techniques, and communities of practice.

Hanson, Kelsey [122] see Hinton, Sarah

Hanten, Nick [236] see Brady, Ryan

Hantman, Jeffrey (University of Virginia)

[251]

Discussant

Hanus, Kasper (Polish Academy of Sciences)

[45]

Water Technologies as a Social Change Facilitator

The Cambridge Dictionary defines “facilitation” as “the act of helping other people to deal with a process or reach an agreement or solution without getting directly involved in the process, discussion, etc.” But could an ancient technology be a “facilitator” of a social change? To resolve that question I will present and verify a model which assumes that the introduction of water management technologies facilitated the development of new social structures in the southern Tarim Basin (Xinjiang, China). The model conceptualizes different ancient interest groups (e.g., local farmers, nomads, Chinese military colonists) as shareholders with different goals, while the introduction of new water management technologies as the facilitator helped to crystallize of sustainable socio-economical system. Tarim Basin between the second century BCE and mid-first millennium CE serves as an interesting case study due to multiple shareholders mentioned above and gradual introduction of water technologies traceable in archaeological material: (a) indigenous agro-pastoral irrigation developments, (b) introduction of Chinese military colonies and finally (c) western Central Asian invention implemented during so-called “Gandhāran migration.”

Hard, Robert (University of Texas, San Antonio), Raymond Mauldin (University of Texas, San Antonio), Jacob Freeman (Utah State University), Ashley Waldrip (University of Texas, San Antonio) and Moureen Kaki (University of Texas, San Antonio)

[179]

Patterns in Radiocarbon Summed Probability Distributions in Texas

Summed probability distributions (SPDs) of large radiocarbon datasets are increasingly used to estimate a variety of population parameters in archaeological research. We compile a dataset of several thousand radiocarbon dates spanning the last 10,000 years from multiple regions of Texas, including the Central and Coastal zones, to assess demographic patterns of hunter-gatherers. The relationships between interregional demographic trends suggested by these SPDs and various ecological patterns are then examined at multiple spatial scales.

Hard, Robert [240] see Carpenter, Michelle

Hard, Robert [5] see Lazik, Lauren

Hard, Robert [179] see Mauldin, Raymond

Hard, Robert [122] see Whisenhunt, Mary

Hard, Robert [156] see Zaragosa, Gabriella

Hardy, François [81] see Forget Brisson, Laurence

Hardy, Meredith (National Park Service)**[273]***Engaging the Present by Uncovering the Past: Community Archaeology and the Legacy of Enslavement, Resistance, and Emancipation, St. Croix, U.S. Virgin Islands*

Since 2014, the National Park Service, as a partner in the Slave Wrecks Project, has conducted community archaeology program as part of multi-year effort combining underwater and terrestrial archaeology with public engagement activities. Christiansted National Historic Site, and the Danish West India and Guinea Company Warehouse complex, St. Croix, U.S. Virgin Islands, is unique in the National Park Service system in that the site was a nexus for the receiving, shipment, and incarceration and torture of Enslaved Africans from 1733–1803 for the Danish West Indies. Captured maroons were incarcerated at Fort Christiansvaern, tried in the Colonial court, and punished or executed, making the fort a symbol of flight from bondage. Since 2017, the Society for Black Archaeologists joined SWP partners in conducting a community archaeology program at Estate Little Princess, also on St. Croix, which introduces students from local high schools and Historically Black Colleges and Universities (HBCUs) to the world of archaeology and coral reef restoration. This paper will highlight both of these programs' efforts to identify archaeological resources pertaining to the lives of the enslaved and engage local youth in the world of heritage resource management.

[273]*Chair***Hare, Timothy (Morehead State University)****[155]***Discussant***Hare, Timothy (Morehead State University), Marilyn Masson (University at Albany, SUNY) and Bradley Russell (University at Albany, SUNY)****[269]***Connecting Ceremonial Groups across the Terminal Classic and Postclassic Constructed Landscapes in the Mayapán Region*

I present an analysis of the landscape connecting shifting ceremonial groups and settlement distributed across the Terminal Classic and Postclassic landscapes in the Mayapán region. Mayapán is the largest Postclassic urban center in the Maya Lowlands and has been the focus of previous research in the area. Traditional and lidar surveys at Mayapán reveal a broader landscape characterized by widely distributed ceremonial groups linking settlements across the region. The Terminal Classic landscape is densely occupied and dispersed. The Postclassic landscape is dominated by Mayapán's walled urban core, surrounded by a halo of ceremonial groups. This analysis examines regional settlement transformations through reconstruction of connections, such as pathways and gates in the constructed landscape in relation to the locations and forms of key public architectural features, walled houselots, cenotes, and the defensive wall. The settlement disjunction between the two periods suggests collapse followed by recovery.

[269]*Chair*

Hare, Timothy [138] see Masson, Marilyn

Harkleroad, Eric**[234]***Scales of violence in Wessex*

There is no consensus on the nature, frequency, or even presence of warfare in Iron Age Britain largely due to the equivocal nature of the remains. By utilizing bellicose references rather than more traditional approaches I examine regional trends in the concern for violence, or warfare, through the Iron Age in Wessex. Sub-regions of Wessex, including Dorset and Hampshire, are compared to each other and larger trends to understand the amount of variation that exists within the region. The sites of Maiden Castle and Danbury are examined to see how these trends manifest at the site level. The concern for violence or warfare is contextualized by examining broader changes in society occurring along with these changes in warfare. The results suggest that changes in warfare are largely driven by indigenous concerns and factors rather than continental influence.

Harkness, Rebecca (University of Arizona)**[184]***Legal Limbo: A Case Study of NAGPRA Policies in the Mimbres Region of Southwest New Mexico*

Mimbres Classic Black-on-white bowls are a hallmark of the Mimbres Classic period (AD 1000–1130) in prehispanic southwestern New Mexico. Some of these bowls are marked by a post-firing modification where a hole is made at the bottom of the bowl and are four times more likely to be from burials. This information is important for museums and institutions that house these bowls, especially when trying to maintain NAGPRA compliance. However, not every bowl with a hole is from a burial context or may not have provenience information due to looting. This creates an issue of how to respectfully treat, display, and house these artifacts. In this poster, I discuss how institutions currently display these objects and what could change to promote more respectful treatment in public exhibits.

Harle, Michaelyn (Tennessee Valley Authority), Laura Smith (University of Tennessee), Suzanne Fisher (Tennessee Valley Authority) and Heather Heart (Tennessee Valley Authority)**[56]***Florence Hawley's Enduring Legacy in Southeastern Archaeology and Beyond*

One of the pioneers of dendrochronology, Florence Hawley was employed by Tennessee Valley Authority (TVA) in the 1930s during the archaeological excavations that were conducted prior to impoundment of Norris Reservoir. Hawley's work was one of the

earliest attempts at establishing a tree-ring chronology in the southeast. While Hawley would go on to have an illustrious career in archaeology in the southwest, unfortunately, sexist attitudes would undermine her efforts in the southeast and her early work was never published. It would be decades before the scientific community realized the importance of this research both within and beyond the archaeological discipline. This paper highlights Hawley's early research in the southeast and describes how TVA is using her early research on red cedar samples to better understand the impacts of large droughts on TVA's operating system.

Harley-Wilson, Terry [172] see Pope, Melody

Harmon, Alaina [132] see Joseph, J.

Harney, Éadaoin [173] see Owsley, Douglas

Harper, Kyle

[161]

Precolonial-Historic Transformations of Amazonian Dark Earth Soils at the Carrazedo Site (Para, Brazil)

In the lower Amazon basin of Brazil, the study of Amazonian Dark Earth soils (ADE), or terra preta do índio has demonstrated the ingenious ways indigenous Amazonians interacted with and altered diverse environments. Developed over several generations in human domestic and agricultural activities through the burning and mixing of biochar, this soil engineering process replaced natural concentrations of iron-rich latosols with significantly elevated levels of P, C, Ca, Mg, Mn, Zn, which contributed to the development of intensive agriculture and complex societies in the region. Upon the arrival of Europeans, ADE production and management would have most likely been altered due to the shift from a precolonial economy of subsistence agriculture to a colonial economy of commodity production. While studies have done well to examine precolonial ADE production processes, as well as some present-day production techniques, there have been relatively few studies that address the differential geo-chemical and archaeological signatures from the precolonial to the colonial and postcolonial periods. This study, currently being carried out at the Carrazedo site, near the Xingu-Amazonas confluence region, seeks to examine the socio-economic causes and technological processes behind ADE variation from the precolonial (~CE 500–1500) to the colonial and postcolonial periods (~CE 1600–1960).

Harrington, Lesley [240] see Pfeiffer, Susan

Harris, Andrew (University of Toronto)

[28]

Theravada Buddhist Monastic Activity at Angkor Thom: A Discussion of What, Where, and When

The religious transition of the Khmer Empire (ca. 802–1431 CE) from Shaivaite and/or Mahayana Buddhism to the religion known today as "Theravada Buddhism" is thought today to be one of the defining social phenomena of the late Angkorian Period (ca. fourteenth–fifteenth centuries) in medieval Cambodia. However, despite the archaeological evidence of over seventy monastic substructures within the terminal Khmer capital of Angkor Thom, the absence of new temples and inscriptions have thrown any exploration of urban activity directly associated with "Theravada Buddhism" by the wayside. Called "Buddhist Terraces" in traditional scholarship and prah vihar by Cambodian archaeologists, investigations of these substructures across three field seasons at Angkor Thom from 2017 to 2019 have yielded incredibly valuable information concerning both specific ritual activities and their chronology at several sites, as well as structural augmentations over time. Furthermore, spatial data alongside diachronic analysis has revealed plenty concerning the importance of "place" in the construction of these monastic buildings, which provides clarity as to how localized religion both supplanted and incorporated previous traditions of temple-building from earlier religious eras at Angkor.

Harris, Brendan, David Moore (Georgia State University) and Chad Keller (Georgia State University)

[186]

Benefits and Challenges of Thick Description in Digital Archaeology and Heritage Management

Archaeologists and historic preservationists have increasingly begun to apply the anthropological concept of thick description in ethnographic fieldwork to that of architectural documentation in order to create more civically-engaged research. This is done by implementing an interpretive and intersubjective framework that deeply examines the social and historical context of a structure in order to better engage with its cultural heritage and with the local community. This poster investigates the value and challenges of incorporating thick description in digital documentation methods over traditional analog methods. Specifically, this project uses a case study to investigate the benefits of both analog and digital processes for documenting historic structures. The National Park Service's Historic American Building Survey (HABS) standards and guidelines are used to document the architectural features of the Carpenter Gothic style Episcopal Church of the Redeemer in Greensboro, Georgia, USA. The analog data collection methods are two-dimensional representations using a tape measure. The digital data collection methods are 3D representations using a laser scanner and structure from motion (SfM) photogrammetry. This research incorporates components of archaeological praxis, such as community-engaged scholarship and participatory knowledge production, to promote the public benefits of archaeology as well as the integration of archaeology with historic preservation.

Harris, Chrys [107] see Gaffney, Chris

Harris, Edward (Retired)**[24]***Discussant*

Harris, Jacob [55] see Coon, Sarah

Harris, Jacob [38] see Martin, Miles

Harris, Katie**[253]***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 homogeneous culture despite a 2,500-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 to technology, and relationships among distinct groups can be inferred. The research presented here considers these changes and asks: can the cultural learning and adaptive strategies of late prehistoric cultural groups be identified in the variability of southern Columbia Plateau projectile points? And how does obsidian procurement reflect changing cultural interactions and exchange networks in the southern Columbia Plateau over the past 2,500 years? 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.

Harris, Matthew (AECOM Technologies) and Matthew Jorgenson (AECOM Technologies)**[55]***A Probabilistic Machine Learning Approach to Modeling Uncertainty in Lithic Source Classification*

The accurate sourcing of lithic material in an archaeological context is critical for formulating hypothesis for regional settlement and trade dynamics. One method for this is to classify the Neutron Activation Analysis (NAA) and X-ray Fluorescence (XRF) geochemical signatures of artifacts based on the same geochemistry of samples from known outcrop sources. Standard practices for lithic source classification from these data is the use of Principal Component Analysis (PCA) for features creation and Mahalanobis distance from the group centroid for source classification. Despite wide-spread use of this method, the non-parametric assumptions of Machine Learning (ML) algorithms can increase the accuracy of lithic source classification on PCA features. Further, probabilistic ML is used to propagate the uncertainty in the estimation of source location to derive a probability distribution of sources. Finally, these methods are tested on both PCA features and raw geochemical data. This study is performed on a large sample of provenanced rhyolite samples and artifacts from the Carolina Slat Belt. The broader implications of this method may be generalizable to geochemical data for any material across all regions.

Harris, Matthew (AECOM Technologies)**[139]***Discussant*

Harris, Matthew [9] see Seibel, Scott

Harris, Stephen [202] see Boudreaux, Edmond

Harrison, Janelle**[60]***CRM and Heritage Management: Employing Modern Technologies in Rock Art Recording at MCAGCC 29 Palms, California*

This paper describes the preservation methods the Marine Corps Air Ground Combat Center (Combat Center) has proposed for the National Register Listed Petroglyph site CA-SBR-161, known as Foxtrot. The Combat Center recognizes the importance of this rock art site; the gap in scholarly research of rock art sites aboard the Combat Center, and understands that rock art sites are in danger of degradation by natural and human impacts. By employing modern technologies such as lidar, D-Stretch, and 3D imaging to record these sites for public outreach and future studies the Combat Centers cultural resources management programs' goals are to expand the understanding of rock art sites of this geographic location from a landscape archeology perspective; and of the Foxtrot petroglyph site in particular. A brief discussion of the panels, motifs and pictographs found at CA-SBR-161, the site known as Foxtrot will be presented, as well as a discussion on employing the same preservation methods to other rock art and rock alignments sites aboard the Combat Center in the future as standard cultural resources and heritage management technique aboard the installation.

Harrison, Laura (University of South Florida) and Brooke Hansen (University of South Florida)**[104]***Mixed Methods Digital Heritage Research at Egmont Key, FL*

Egmont Key, Florida served as an internment camp for Seminoles during the Indian Removal Period, a haven for runaway slaves and Union soldiers during the Civil War, an outpost for rum runners during Prohibition, and a strategic military installation in multiple nineteenth- and twentieth-century conflicts. Today, these histories (and others) are largely invisible to the public due to limited outreach infrastructure on the island, and inadequate public-facing interpretive materials. There is a pressing need for such content because the island is an established tourist destination drawing over 200,000 visitors each year. Furthermore, in 2017, this

diminutive 2 km² island was named one of the most endangered heritage sites in Florida: it has lost almost half of its landmass in the last century due to coastal erosion and many historic sites are on the verge of submersion. This paper details a collaborative, mixed-methods project that combines archival research, 3D laser scanning, and Seminole oral histories to bring these invisible stories to life with interactive digital content aimed at increasing public understanding and awareness of Egmont Key's endangered heritage.

[104]

Chair

Harrison, Laura [104] see Bonacini, Elisa

Harrison, Laura [104] see Cali, Denise

Harrison-Buck, Eleanor (University of New Hampshire)

[14]

Introduction to the Lower Belize River Watershed: A Deep History of Human-Environment Interaction

This paper situates the results of nine years of archaeological investigations by the Belize River East Archaeology (BREA) project, beginning more than 10,000 years ago in the preceramic period. We have also documented ample Maya occupation, including their settlement, production activities, ritual ceremonies and other aspects of daily life. The BREA study area contains over 122 km² of perennial wetlands (28% of all wetlands in Belize). Our investigations have documented a long history of human-wetland interaction beginning in the preceramic and continuing through the Maya period. European Contact has also been detected, when Spanish entradas penetrated these swamps en route to the Petén. Logwood in these swamps later attracted the British Baymen, who settled in the lower Belize Watershed, including Crooked Tree—today one of the oldest Creole communities in Belize. The archaeology of the Creole, descendants of European and enslaved Africans, has been the focus of our recent investigations. In 2018, BREA worked with the community of Crooked Tree to develop a museum and cultural heritage center. It features the results of the BREA archaeological research, from preceramic to colonial times. The museum is geared for the public, namely local school-age children, aimed at promoting long-term cultural sustainability.

[14]

Chair

Harrison-Buck, Eleanor (University of New Hampshire)

[127]

Discussant

Harrison-Buck, Eleanor [14] see Craig, Jessica

Harrison-Buck, Eleanor [14] see Krause, Samantha

Harrod, Chris [61] see Santana Sagredo, Francisca

Harrod, Ryan (University of Alaska Anchorage)

[131]

Why We Study Violent Behaviors in the Past: Dr. Debra Martin's Contributions to Research on Systems of Socially Sanctioned Warfare and Systematic Exploitation

Dr. Debra Martin's work has enhanced our understanding of how different forms of violent interaction are often supported by cultural ideology. Additionally, she has highlighted the physical and social impact violence-related trauma has on individuals. My scholarship continues her work of analyzing human skeletal remains to reveal violent interactions. Building on the collaborative work we have done together, I illustrate here, the biological consequences of persistent threats of violence as a means of social control over individuals. The intent is to examine the complex relationship between peace and conflict, from intergroup hostilities that result in regional warfare, to systems of captivity and exploitation that target women and children and/or nonlocal laborers. My research focuses on how violent exchanges affect people's daily lives and are tied to cultural ideology, and ways the influence of violence transcends multiple generations. Dr. Martin has, and continues, to encourage my passion for studying the nature of human violence. She has encouraged me to develop theoretical and methodological approaches for better identifying and interpreting conflict, and realize how interactions between individuals and among groups, both as direct and structural violence, were part of daily practice and ideology in the past.

Harrod, Ryan [210] see Martin, Debra

Harry, Karen (University of Nevada-Las Vegas)

[88]

Discussant

Harry, Karen [142] see Perez, Daniel

Hart, Elizabeth (Metropolitan Museum of Art)

[232]

Changes in Ancient Egyptian Flaked-Stone Sickle Production, Fifth–First Millennia BCE

Flaked-stone sickle inserts were produced in Egypt for thousands of years, even after the introduction of metals. Scholars have

explained their endurance in Egypt primarily as a combination of functional and economic factors: flint works as well as metal, and it is abundant, so it must be cheaper and easier than metal sickles. However, this simple explanation does not account for any variability that occurred in sickle production over time. Supported by a Metropolitan Museum Fellowship, this study documented attributes of flaked-stone sickle inserts across time periods, focusing on raw materials, flaking technologies, dimensions, use, and re-working. The results show that three main sickle insert types can be defined based on technology, and that there are different degrees of specialization for each. This study demonstrates that sickle insert production did change substantially over time, and that sickle function, economic organization, and even harvesting practices were in a dynamic dialog with technological, political, and social factors. These results are significant for understanding how tools got into farmers' hands, and hence how their lives were affected by larger-scale changes.

Hart, Isaac (University of Utah), Andrea Brunelle (University of Utah), Jennifer DeGraffenried (U.S. Army Dugway Proving Ground) and Kaylee Jones (University of Utah)

[66]

A New Radiocarbon Chronology for Lake Bonneville Sediments

We present a new radiocarbon chronology for Lake Bonneville sediments and discuss implications for human settlement of the Lake Bonneville basin during the Pleistocene/Holocene transition. Our chronology combines radiocarbon dates from multiple sediment cores, aligned by visual stratigraphy and X-Ray fluorescence based geochemical signatures, and indicates a lake was present in the Lake Bonneville basin until just after 13 cal ka. While the basin has a rich Paleoindian archaeological record with hundreds of stemmed point sites, fluted points are nearly absent from Lake Bonneville Basin lowlands. Our updated lake chronology suggests the presence of a lake in the basin's lowest elevations during much of Clovis times may have precluded the area's use by fluted point-wielding people.

Hart, Isaac [62] see Taylor, William

Hart, John [29] see Vavrasek, Jessica

Hart, Siobhan (Skidmore College)

[172]

Curating Archaeological Collections in the Private Small Liberal Arts Context

This paper considers archaeological curation in a private, small liberal arts college (SLAC) context. Many SLACs have archaeological collections acquired through donation from alumni or local residents, occasionally through purchase or orphaning, and increasingly through student and faculty research on and off campus. These collections are sometimes curated by professional staff in a dedicated museum, but more often are curated within an academic department by a single faculty member. In these situations, faculty-curators must meet legal requirements and ethical imperatives while also advancing institutional missions of active and applied learning. Archaeological collection curation can offer rich opportunities for teaching and student learning. It also requires significant resource investments from institutions and individual faculty. Meeting standards of care and commitments to inclusion, access, and community engagement present both challenges and opportunities in the SLAC context. I consider both with examples drawn from my own experience as a faculty-curator.

Hart, Thomas (Franklin and Marshall College), Arlene Rosen (University of Texas, Austin) and Richard Walter (Sul Ross State University)

[40]

Late Paleoindian Plant Use and Foodways at the Genevieve Lykes Duncan Site, Texas: Phytoliths, Starch Grains, and Calcium Oxalate Evidence

The early Paleoindian lifeways of Pre-Clovis, Clovis, and later Folsom populations have been the subject of much interest. They are characterized as highly mobile hunter-gatherers who followed large herds of game across the plains of North America. In contrast, very little attention has been paid to understanding later Paleoindian populations, and we know particularly little about their plant foraging strategies and how they might have transitioned away from a focus on big game hunting, toward a broader subsistence base that were more typical of the Archaic Periods. Excavations at the site of Genevieve Lykes Duncan, Texas revealed three late Paleoindian stone lined hearths stretching from 11,000–8,180 cal BP. An analysis of starch grains, phytoliths, and calcium oxalate crystals from these hearths revealed potential calorie-rich foods and utility taxa such as cacti and desert succulents, palmettos, and gourds. Reed phytoliths suggest a local environment that was marshy and damp, while specific grass phytoliths indicate that the hearths were used seasonally. This presentation examines these results in detail and discusses their implications for diet, fuel use, and the local environment during the late Paleoindian period of Texas.

Harte, Marybeth (Logan Simpson) and William Bryce (Logan Simpson)

[229]

A Fresh Look at the Prescott Archaeological Tradition

The Transition Zone separating the Southern Basin and Range from the Colorado Plateau within central Arizona has long been an area of archaeological inquiry. For over a century most of this research has focused on the eastern and central portion of the Transition Zone. Recent work on the Prescott National Forest, within the western zone, produced considerable pedestrian survey data on the Prescott archaeological culture. These data support notable site type variation within small areas inhabited by Prescott groups. While the non-perishable material culture suggests insularity, additional lines of circumstantial evidence point toward interaction and trade using perishable goods. This presentation seeks to initially reassess concepts of the Prescott cultural area in terms of internal identities and cultural markers, re-examine the extent of Hohokam influence in the region, and take a broader look

at the population's role in a larger external trade network.

Hartfield, Kyle [186] see van Leeuwen, Willem

Hartman, Adam (University of Cincinnati)

[120]

Roman Fine Ware Ceramics from the Hinterland of Molyvoti, Thrace

This research examines the economic integration of the hinterlands surrounding the Classical Greek site of Stryme (modern-day Molyvoti), located on the coast of the northern Aegean in the region of Thrace, into the broader exchange networks of the Roman Empire through an analysis of the imported Roman fine ware ceramics recovered through surface survey. The assemblages of Roman fine ware from two hinterland sites, Glyphada-Agkathies and Mitrikon-Metochi, are examined in two primary ways: 1) analysis of the composition of the assemblages in terms of vessel forms, decorative motifs, and clay fabrics from the hinterlands of Classical Stryme, and 2) comparison of the Stryme ceramics to other published ceramic assemblages from other sites in the region. This analysis of the ceramics from the hinterlands of Classical Stryme helps to clarify the site's position in the broader exchange networks of the Roman Empire, while a comparison with other sites in the region provides a greater understanding of Stryme's position at a more local level.

Hartman, Gideon [159] see Vaiglova, Petra

Harvey, David [243] see Neme, Gustavo

Harvey, Virginia (University of Manchester, UK), Michelle LeFebvre (Florida Museum of Natural History, University of Florida), Casper Toftgaard (National Museum of Denmark, Nationalmuseum), Konstantina Drosou (KNH Centre for Biomedical Egyptology) and Michael Buckley (University of Manchester)

[212]

The Role of Ancient Biomolecules in the Potential Discovery of an Extinct Marine Turtle

Advancements in molecular science continue to improve our understanding of modern marine turtle biology. Yet, past turtle distributions and how humans have influenced them remain vastly understudied. Zooarchaeological analyses focusing on informative biomolecules such as proteins and DNA are becoming increasingly significant in unveiling secrets from our past oceans, particularly when bone remains are fragmented and thus difficult to assign taxonomic identity. Here, we analyse 130 archaeological marine turtle bones up to 2500 years old from seven sites across the Caribbean and Florida's Gulf coast. All of the samples were analysed using collagen fingerprinting ('ZooMS'), which allowed species-level identification in the vast majority (85%). From these analyses we identified two different chemical signatures in archaeological green turtle samples, *Chelonia* spp., signifying a potential difference in genetic stock—one identical to the modern day green turtle, *Chelonia mydas*, and the other a possibly extinct and undescribed species. Ancient DNA (aDNA) sequencing was employed on samples from both groupings with the aim of verifying this claim, yet amplification failed due to poor DNA preservation. Here, we discuss the advantages and disadvantages of proteomics and aDNA analyses on bone remains from the tropics in view of uncovering precise taxonomic identification.

Harvkey, Jesse

[228]

The Unseen Archaeology of Disability and Impairment

Disability and impairment are two vitally important aspects of the human condition that have been present throughout history. Yet, they have continued to be underrepresented by the field of archaeology which so tirelessly attempts to understand the human past in all its expansive facets. Perhaps the reason for this shortcoming is the state of ongoing societal invisibility which this social group currently faces, unknowingly shaping theoretical foci of archaeological inquiry to be unintentionally ignorant of their essential role in understanding this facet of human history. The archaeology of disability is relevant to modern disability studies and vital to the understanding of the evolution and current state of the social construct which has varied in cultural definition for years. The purpose of this paper is to highlight the value of inclusive theory and practice in the archaeological interpretation of disability and impairment in a social context. It will provide examples of the complexity of the social group's past as seen in the archaeological record through artifactual remains reflective of impairment and disability in a wide array of contexts and describe variant historic topics of inquiry which may help to further ascertain the nature of "disabled" individuals' lives in the past.

Harvkey, Jesse [254] see Hampton, Ashley

Hasenstab, Robert

[175]

Customized Interpolation of Lidar Data: A Case Study from Casper Bluff, Illinois

Often lidar data are distributed in pre-processed form, either in raster grid (e.g., TIF image) or vector GIS (contour lines) format. In such cases the spatial resolution is generalized in order to mask any imperfections in the data. Such smoothing loses any detail in the surface data—detail of a scale at which archaeological features may occur, e.g., meter or sub-meter. This paper outlines a workflow by which .las files can be broken out into individual mass points. These x,y,z points can then be processed through customized surface interpolation functions. Data from Casper Bluff Reserve, JoDaviess County, Illinois were processed. Results revealed a thunderbird intaglio feature.

Hassam, Stephan, Davide Tanasi (University of South Florida) and Kaitlyn Kingsland (University of South Florida)**[104]***Digital Photogrammetry and Terrestrial Laser Scanning Applied to the Roman Hypogeum of Crispia Salvia in Lilybaeum (Marsala, Italy)*

The hypogeum of Crispia Salvia in Marsala, Sicily (ancient Lilybaeum) gets its name from a painted inscription above a tomb naming the deceased. This uniquely well-preserved chamber tomb contains an important series of frescoes informing us about interesting Pre-Christian funerary rites. The hypogeum was discovered recently during the construction of an apartment complex in the 1990s, which has made it relatively underrepresented in the literature, despite its uniqueness in Sicily and the excellent state of preservation of its frescoes. The site, covered by private property, is very difficult to access, contributing to the difficulty scholars face in researching the site. Considering the gradual improvement of 3D visualizing technologies, the University of South Florida Institute for Digital Exploration (USF IDEX), as part of a wider digitization project of Sicilian cultural heritage, digitized the hypogeum of Crispia Salvia in 2018 in order to increase its visibility in scholarly circles and to the public. Digitization was carried out using digital photogrammetry and terrestrial laser scanning. The results of the digitization project provide an accurate photorealistic virtual version of the hypogeum, accessible to the public and researchers interested in the frescoes and morphometrics of the site.

Hassam, Stephan [104] see Kingsland, Kaitlyn

Hassett, Brenna (University College London)**[210]***I'll Show You: The Visibility of Violence in Human Sacrifice at the Edge of Early "States"*

This paper examines the visibility of a specific type of violence theorized to be a near-universal tool of constructing the hierarchical power relationships that comprise early "state" societies: human sacrifice. A social-control model proposes human sacrifice serves as a tool for display and legitimization of social control by an elite over a nonelite group and is an endemic feature of lineage-based control of social hierarchies that comprise early state societies. It is critical to interrogate the relationship of violence experienced in a human sacrifice context and the violence displayed as part of a human sacrifice event in order to evaluate this model. We use a case study from the Early Bronze Age cemetery at the site of Başur Höyük in the Upper Tigris River region of modern-day Turkey to reconstruct the visual presentation of human sacrifice and examine whether the display of violence can be easily equated to the display of power.

Hastorf, Christine [59] see Bruno, Maria C.

Hastorf, Christine [61] see Miller, Melanie

Hatcher, Lawford (University of Alabama), Emily McKenzie (University of Alabama), Juan Monzon (University of Alabama), Caleb Ranum (University of Alabama) and Katherine Chiou (University of Alabama)**[147]***Introducing Paleoethnobotany to Machine Learning: a Case Study in the Genus Capsicum*

Chili peppers (*Capsicum* spp.) are an incredibly diverse and abundant crop across the Americas whose domestication began around 10,000 BP as a complex co-evolutionary process between humans and these plants. This genus has served many culinary, medicinal, and ritualistic uses throughout its evolution and diversification. With an interest in tracking the domestication of the *Capsicum* genus over time, we seek to develop a method of species-level identification based on seed morphometrics. To this end, we test a variety of machine learning algorithms on the collected morphometric data to determine which best models the high-dimensional space of the data. Machine learning algorithms utilized are linear discriminant analysis, neural networks, decision tree, Random Forest, as well as a series of dimensionality reduction algorithms to prevent overfitting. We also compare these models to previous models developed for species-level identification of *Capsicum* seeds. As the only remaining portions of chili pepper at archaeological sites are very often the seeds, these species-level identification models can be utilized in the field to identify the species of seeds found in order to track their domestication over time.

Hauser, Mark [239] see Wallman, Diane

Hawkins, Alan and Lara Noldner**[231]***Emergency Assessment and Salvage at 13PM7, a Mill Creek Village Site*

Archaeological site 13PM7 (a.k.a. Joy Creek Major) was originally recorded in 1965 as a Mill Creek culture (Initial variant Middle Missouri tradition) "midden mound" and surface scatter site along the Big Sioux River in Plymouth County, Iowa. Following a levee failure due to heavy rainfall in the spring of 2019, a much more extensive artifact scatter and multiple features were exposed at this village site, as well as a human burial feature and isolated human remains. In order to determine the best preservation strategy and condition of the site, the Iowa Office of the State Archaeologist applied for, and was awarded, an Emergency Historical Resource Development Program (HRDP) grant from the State Historical Society of Iowa to conduct limited surface survey and subsurface testing. This presentation summarizes the results of the fieldwork at the site.

Hawkins, Rebecca and Julie Olds (Miami Tribe of Oklahoma)**[49]***Lost (and Found) in Translation: Successfully Navigating the Culturally Foreign NAGPRA Process*

Over a period of six years beginning in 2012, a group of tribes formerly resident in the lower Great Lakes region, but removed to

Oklahoma Indian Territory in the 1800s, engaged in NAGPRA consultations and negotiations with an institution in Indiana. The lengthy process was ultimately successful, from the authors' perspective, when it concluded in a manner satisfactory to the tribes in late 2018. However, the multiyear interaction was often rancorous, redolent with mistrust, and fraught with technical disagreements. Indeed, the project was heavily freighted with lessons hard learned regarding the potential impacts on successful repatriation of competing tribal and institutional goals and disparate interpretations of archaeological contexts and related information. Ultimately, the experience was instrumental in teaching us how to better navigate a culturally foreign process. Moreover, it not only has taught us how to improve our approach to NAGPRA matters, it has given us valuable insights on how to help institutions with whom we consult understand both our specific information needs and our traditionally nuanced perspectives.

Hawkins, Rebecca

[70]

Discussant

Hawkins, Rebecca

[154]

Discussant

Hawkins, Rebecca [49] see Thomas, Jayne-Leigh

Haws, Jonathan (University of Louisville), Nuno Bicho (ICArEHB, Universidade do Algarve), João Cascalheira (ICArEHB, Universidade do Algarve), Mussa Raja (ICArEHB, Universidade do Algarve) and Milena Carvalho (ICArEHB, University of New Mexico)

[11]

Stone Age Archaeology in the Lower Save River Valley, Southern Mozambique

The goal our project is to investigate the Stone Age archaeology of the coastal region of southern Mozambique. This region has great potential to inform on early modern human behavior because it contains extensive and diverse Quaternary-aged deposits. Despite its geographic proximity to well-known southern African hotspots of Stone Age archaeology, southern Mozambique represents a major gap in our knowledge due to a lack of research in the region due to civil war and political instability in the late twentieth century. In 2019, we conducted a reconnaissance survey of the lower Save River valley in the southern half of Mozambique. This area had no previously documented sites, but we chose this valley because of the occurrence of exposed Quaternary gravel and sand deposits along drainages leading into the Save River. The initial survey found that these deposits on the north side of the valley contained abundant raw material in the gravels and that numerous lithic scatters exist that can be dated on technological grounds to the Middle and Later Stone Age. Testing at one locality, Zimuara 1, confirmed the presence of stratified deposits in a paleosol exposed in a quarry. Here, we report the preliminary results of our survey.

Haws, Jonathan [250] see Bicho, Nuno

Haws, Jonathan [36] see Carvalho, Milena

Haws, Jonathan [36] see Ellis, Grace

Hayashida, Frances [224] see Murphy, Beau

Hayes, Vivienne (University of Pittsburgh), Colin Quinn (Hamilton College), Jess Beck (McDonald Institute for Archaeological Research) and Horia Ciugudean (Muzeul National al Unirii, Alba Iulia)

[35]

Place as Identity: A Diachronic Analysis of People and Mountain Landscapes in the Romanian Bronze Age

People and their environment are inextricably linked. By using and manipulating landscapes, people actively construct place and identity. As a result, archaeologists can analyze landscapes to better understand the dynamics of identity. With this poster, we present mortuary archaeology and geophysical survey data to discuss changing identities and practices in Bronze Age Transylvania. The Apuseni Mountains in Transylvania, Romania have provided archaeologists critical information regarding migration and social complexity during the Bronze Age. Rich metal deposits contributed to an expansion of trade and led to marked changes in social practices over time. Yet, there is still much we do not know about how and why these peoples shaped this mountainous environment. Our methods allow us to compare distinctive alterations of these landscapes over several distinct periods of human activity. This approach allows for a greater understanding of interaction among the communities that inhabited mountainous landscapes in the past while suggesting new modes of considering place as identity.

Hayeur Smith, Michele (Haffenreffer Museum of Anthropology)

[50]

Invisible Women in a World of Men: The Textile Trade in the North Atlantic AD 1000–1600

Waterlogged or deeply buried deposits from medieval harbors in certain northern European towns have produced large and well-preserved textile assemblages that contain a surprising number of non-indigenous textiles. Some of these appear to have originated in the North Atlantic Islands (Iceland, the Faroes, the Hebrides, Shetland, and perhaps Greenland) while others may have been moving from continental Europe to those islands. How did these textiles get there? How were they traded? And how did textiles often labelled as "Wadmol" in medieval documents, and known as *vaðmál* in the North Atlantic islands fit within, and flow through, international trade markets linking the North Atlantic with Northern Europe? With the help of strontium isotope analyses conducted through Brown University's Department of Earth and Environmental Sciences to source the textiles, we have been exploring the roles of women in North Atlantic societies and their involvement in both international textile trade networks and production to meet

their own local needs on their farms in the distant islands of the North Atlantic.

[50]

Chair

Hayeur Smith, Michele [50] see Bielenberg, Aliosha

Hayflick, Emily (Bard Graduate Center)

[218]

Discussant

Hayhurst, Paige [5] see Lazik, Lauren

Hays-Gilpin, Kelley (Northern Arizona Univ)

[99]

Discussant

Hays-Gilpin, Kelley (Northern Arizona Univ)

[111]

The Peculiar and Multifaceted State of Rock Art Site Management in the Western United States

Public lands are under attack in the western United States now more than ever. This presentation reviews a few areas where international collaboration to promote rock art preservation and management should prove fruitful, and reviews the peculiar background of heritage resource management in the United States as it pertains to rock art sites and landscapes.

Hays-Gilpin, Kelley [2] see Webster, Laurie

Hayward, Michele (Panamerican Consultants), Jonathan Hanna (Pennsylvania State University), Donald Smith (Panamerican Consultants Inc.), Michael Jessamy (Cultural Heritage Officer Grenada) and Michael Cinquino (Panamerican Consultants Inc.)

[60]

Rock Art Distribution in the Windwards: A GIS Perspective

Rock art locations in the Caribbean are well known, involving caves, waterways, coasts, inland rock formations, and ceremonial enclosures. Mythological (caves as center of origin and fertility) and practical considerations (guardians of freshwater sources) have been offered as general explanations for their settings. GIS procedures offer an opportunity to explore in greater detail particular site locations, in addition to suggesting possible reasons for the observed site distributions. Our exploration of rock art settings in the Windward Islands will involve comparing petroglyph rock art distributions and those with workstones (boulders with cupules and/or sharpening lines) to non-rock art distributions employing such environmental factors as distance from fresh water sources, elevation, and astronomical positioning, and such rock art attributes as element number and images types.

He, Yahui (Stanford University)

[45]

Food Processing Technologies in Early Neolithic Northern Zone, China: Preliminary Study on Microbotanical Residues at the Sites of Yumin and Simagou

Situated in an ecologically sensitive and fluctuated area, the so-called Northern Zone, today's south-central Inner Mongolia along the Yin Mountains, has long been considered as the frontier of Chinese civilization where grassland and agricultural land intertwine, entailing the diversity of subsistence strategies as well as sociocultural landscapes, en route to regional societal complexity. Moreover, this region lies at an intersection of cultural interactions, not only connected to the Eurasia steppe farther north and west, but also to the Yinshan Mountains eastwards and westwards, and even the Loess Plateau to the south. This study is targeted to explore possible food processing technology in the boundaries across south-central and Inner Mongolia in China during the early Neolithic period. The early Neolithic cultures in Northern Zone are characterized with the sites of Yumin and Simagou, both located in Huade County, Inner Mongolia. The results from residue study indicate that different types of tubers, Panicodidae, and Triticeae were the main plants consumed by people during this time period. By revealing microbotanical residues from the artifacts, mainly stone tools at the two sites, this study will facilitate to investigate local foodways, subsistence strategy and human-environment relationship in this region during the early Neolithic period.

Headrick, Annabeth (University of Denver)

[166]

Ice and the Sun: The Aztec Calendar Stone and Its Origins

While many scholars have suggested that the Aztec sacrificed individuals on the Calendar Stone, this paper will not only explore this aspect but also the object's affiliation with another form of sacrifice, auto-sacrifice. Using ethnohistoric records, connections between the imagery of the stone and acts of human sacrifice will expand upon why this imagery was deemed appropriate for this ritual act. Furthermore, an argument will be made that the iconography of the monument crystalizes ritual acts, actually recording in stone ephemeral sacrificial events and thereby making the transient permanent. When addressing evidence for the autosacrificial symbolism of the monument, the paper will identify iconographic precedents for the imagery on the Calendar Stone, specifically imagery from Palenque and Chichen Itza. Through an exploration of the origins of the monument's imagery, a clear case may be

made that not only was autosacrifice intrinsic to the Calendar Stone, but also the intimate relationship between rulers and solar-related sacrifice was part of the intended symbolism. In sum, by identifying both related but distinct forms of sacrifice within the imagery, a strong case can be made that royal prerogative intrinsically shaped sacrificial acts of all types.

Heard-Booth, Amber (Michigan State University College of Human Medicine)

[153]

Discussant

Heart, Heather [56] see Harle, Michaelyn

Heath-Stout, Laura (Rice University)

[1]

Pulled In or Pushed Out? Diversity, Discrimination, and the Recruitment of the Next Generation of Archaeologists

In this Presidential Forum, we are exploring how and why archaeology remains dominated by white, straight, cisgender people, and (in positions of power) men. One piece of this puzzle is recruitment of archaeologists, which tends to take place in field schools and academic departments. How do these programs reproduce homogeneity in our discipline? In order to address this question, I use data from my qualitative study of diversity and oppression in archaeology, in which I conducted in-depth interviews with a diverse sample of 72 archaeologists working in Mediterranean, Mesoamerican, and/or historical archaeology and in U.S. higher education contexts. I demonstrate that my interviewees were pulled into or pushed out of academic and research opportunities on the basis of not only their interests and merit, but also their social identities. I show that marginalized archaeologists (e.g., women, people of color, queer people) must navigate career paths not only following our interests, but also seeking accessible and welcoming opportunities and safety from discrimination and harassment. This process creates an extra cognitive burden for us to bear, making it difficult for us to succeed in the discipline. These conditions limit the diversity of our field.

Heath-Stout, Laura (Rice University)

[72]

Chair

Heath-Stout, Laura (Rice University)

[91]

Discussant

Heath-Stout, Laura [72] see Jalbert, Catherine

Hebda, Christopher (University of Victoria)

[195]

Navigating Deep Water: Multidisciplinary Archaeology in British Columbia and the Late Pleistocene Peopling of the Americas along the Pacific Coast

Recent research has raised many questions about alternatives to the Clovis-first paradigm of the peopling of the Americas: What does a coastal migration of early peoples into North America look like? When did they arrive? Was their passage blocked by ice? Were there plants and animals on the late Pleistocene landscape to sustain them? This study draws on archaeology, geology, palynology, ethnobotany, and genetics to demonstrate the presence and significance of vegetated terrestrial environments during the late Wisconsin Fraser Glaciation extending to nearly 18,000 cal BP on the outer coast of northern Vancouver Island, British Columbia, Canada. During this time, the outer coast was dominated by herb tundra but remained vegetated. We also demonstrate arboreal environments in the mountains of central Vancouver Island extending to nearly 14,500 cal BP, proximal to early period archaeological deposits. However, this study is only one small piece of an ongoing dialogue that would be impossible without the intellectual and physical effort of generations of Indigenous knowledge holders, archaeologists, and other scientists. Extending beyond traditional archaeological investigation, these multidisciplinary projects—past, present, and future—are fundamental to understanding the deep history of the plants, animals, and people of the northwest coast of North America.

Hechler, Ryan (Tulane University)

[201]

Where's the Lived Reality? Investigating Non-Monumental Spaces at the Monumental Site of Cochasquí, Ecuador

Archaeological research of the Integration Period of the northern highlands of Ecuador has long focused on monumental pyramids, burial mounds, and shaft tombs. While non-monumental and non-mortuary spaces have been investigated in exceptionally limited cases, no residential nor activity space has yet to be conclusively determined. In 1964, Udo Oberem investigated an area of the monumental site of Cochasquí simply known as the "Pueblo"—although, his own research did not prove the presence of an actual village but instead found a complicated context that was never properly analyzed. To better understand the non-monumental landscape, excavations were continued at Oberem's own Pueblo and remote sensing—ground-penetrating radar and gradiometer—were implemented in other areas of the site. Quickly, it is becoming clear that Cochasquí has much more than pyramids and burial mounds to define the site.

[201]

Chair

Hechler, Ryan [201] see Chavez-Chuquimarca, Andrea

Hechler, Ryan [201] see Ward, Maxwell

Heckel, Claire (University of North Carolina, Greensboro)

[259]

Material Culture in the Archives: Examples from the Digital Library on American Slavery

The Digital Library on American Slavery is an expanding digital collection of historical documents related to slavery in the United States. Approached with attention to material culture, these documents offer insights into the economic lives and material practices of enslaved persons that can complement archaeological assemblages and inform their interpretation. This paper draws on examples from the Race and Slavery Petitions Project, the Runaway Slave Advertisements Project, and the People Not Property Project to highlight some of the ways in which material culture is documented in digital archives and how these archives might enrich practices in archaeology, cultural heritage management, and public history. Particular attention is given to: how freedom-seekers provisioned themselves for escape, the material culture of maroon communities and slave insurrections, the independent economic activities of enslaved persons, and objects of trade as vessels for the dissemination of subversive literature and contraband materials.

[259]

Chair

Heckenberger, Michael (University of Florida)

[161]

An Archaeology of Hope: How the Past Informs Indigenous Futures in the Southern Amazon's "Arc of Deforestation"

Two decades of relentless agropastoral development has reduced closed tropical forests across northern Mato Grosso to small patches. Within the so-called arc of deforestation along the southern margins of the Amazon basin's tropical forests, larger blocks are primarily restricted to indigenous areas, although these areas are also acutely threatened by public health and environmental problems related to agropastoral development, such as regional desiccation, water pollution and fire susceptibility, and changes in diet and health. Many commentators believe technological innovation or political change will curb the destruction, or not, but archaeology suggests that the past may also offer important clues to managing contemporary change. In the Upper Xingu region, over two decades of ethno-linguistic and archaeological documentation have revealed large, densely settled precolumbian populations in the centuries before first European contacts in South America. These societies developed sophisticated systems of land management to support a regional society of 50,000 or more, reduced to 500 people in the mid-twentieth century. Here current problems are considered against this backdrop of deep indigenous history to show how ancestral practices provide "home-grown" solutions to current risks, such as soy, fire and diabetes, through robust partnerships with indigenous populations across the Xingu drainage basin.

[161]

Chair

Heckman, Jasmine [132] see Joseph, J.

Heckman, Jasmine [187] see Mundt, Jessica

Hedlund, Jonathan [6] see Gilmore, Kevin

Hedman, Kristin [233] see Simon, Mary

Heep, Nathan, John Stauffer (Washington University, St Louis), Jesse Nowak (University of Oklahoma), Matthew Colvin (University of Georgia) and Johann Sawyer (University of Southern Carolina)

[166]

Dr. F. Kent Reilly III: Pioneer of Emic Approaches to Native American Religions and Art

This paper highlights the changing perspectives of Dr. F. Kent Reilly during his early career and the creation of the annual Mississippian Iconography Workshop at Texas State University, where emphases on professional collaboration, student mentorship, and engagement with Native American communities have been flagship products of over two decades of research. The annual iconography workshop was established using the framework employed by the famous Maya Meetings founded by Reilly's mentor, Linda Schele, whose legacy has provided innumerable resources to students, academics, and Native American communities alike. Throughout its existence, scholars have collaborated on approaches that still seek to demystify Native American religious and political perspectives. In particular, the landmark publications produced from these efforts have emphasized topics drawing from ethnohistory, iconography, and archaeology to address topics of social stratification, cosmology, and mnemonics. As with the initial formulations of the workshop, these research agendas have established an invaluable bridge between Mesoamerican and North American scholarship, resulting in the distinction and comparison of past social conditions among Pre-Columbian cultures in the Americas.

Hegmon, Michelle (Arizona State University) and Sarah Striker (Arizona State University)

[98]

Stylistic Variation in Prehistoric Ceramics: Mimbres Geometric Designs

Mimbres black-on-white pottery, from southwestern New Mexico, is renowned for its naturalistic designs, which have been the subject of numerous analyses focusing on the content and meaning of the depictions. Geometric designs, however, are more

common on Mimbres pottery, comprising about 65% of the corpus. In this paper, we focus on these mostly neglected vessels with geometric designs dating to the Mimbres Classic period (ca. 1000–1130 AD). A previous study found that naturalistic motifs were distributed homogeneously across sites in the Mimbres Valley, and these results were interpreted as indicative of a common set of materially symbolized beliefs. Our paper asks if the same homogeneity is seen in the geometric designs. The analyses use methods and theory developed in Stephen Plog's early work on stylistic variation, including a hierarchical system for coding design attributes and attention to several sources of variation. The data are drawn from MimPIDD—the Mimbres Pottery Images Digital Database—which points to the importance of online databases including the Chaco Research Archive, developed by Plog.

Heidkamp, Blair (University of Texas), Yorke Rowan (Oriental Institute, University of Chicago), Alexander Wasse (Yeditepe University) and Gary Rollefson (Whitman College)

[125]

There and Back Again: Ground Stone Evidence of Seasonality at Structure W80, Wisad Pools, Jordan

One of the study areas for the Eastern Badia Archaeological Project is Wisad Pools, located in the Black Desert of the panhandle of eastern Jordan. The Pools, which fill with the annual rains, are surrounded by hundreds of stone-built structures, presumably from the Late Neolithic. Excavations of one structure, W80, revealed complex stratigraphy with occupational deposits spanning at least 1000 years. Throughout the intermittent periods of use, a pattern became apparent in which most hand stones were deposited up against the interior walls of the structure. The particular positioning of these tools implies that the placement was in fact intentional, possibly while the structure was occupied and during periods of abandonment. Previous interpretations of the area have argued that the structures at Wisad Pools were occupied seasonally to take advantage of gazelle herd migrations (Rollefson et al. 2014, 2018; Rowan et al. 2017). Securing the handstone and pestle's position indicates an intent to return to the same region and the same structures again. By investigating the spatial distribution of the various ground stone tools found at W80 we hope to gain further insight on the cyclical process of humans interacting with the region.

Heilen, Michael (Statistical Research, Inc)

[89]

Discussant

Hein, Anno [196] see Kilikoglou, Vassilis

Heitman, Carrie (University of Nebraska, Lincoln) and Worthy Martin (University of Virginia)

[98]

The Chaco Research Archive: Research Impacts and Future Prospects

Dr. Stephen Plog had the foresight to envision the Chaco Research Archive back in 2001. Under his leadership, this resource (chacoarchive.org) ushered in a new era of research on Chaco Canyon which has reverberated far beyond the academy. In this paper, I reflect on the process and products of its creation, its academic impact, and Dr. Plog's legacy.

[98]

Chair

Helmer, Emily (Washington State University)

[177]

Social Organization of a Late Holocene Village in Southern Oregon

Artifact distribution analysis has been used across the Northwest Coast as an effective tool to understand and define activity areas and social organization. However, it has been underutilized in the southernmost portion of this culture area. This study analyzes 35JA100, a Late Holocene village in southern Oregon excavated in 1982. The ethnographic record of the region indicates that households within a village operated largely independently and were arranged into "sweathouse groups," wherein related men cohabitated in a sweathouse while women and children lived in their own nearby houses. In order to investigate the antiquity of this social organization, data initially derived from an extensive CRM recovery project is used to reconstruct the activities occurring in houses at 35JA100. The results demonstrate an apparent lack of specialization between houses, apart from a single structure with unique features and a higher frequency of artifacts associated with men's labor and ceremonial activities. This distribution suggests that the existence of both household autonomy and special-use structures associated with men were in place prior to contact.

Helmke, Christophe (University of Copenhagen) and Sergei Vepretskii (Russian State University for the Humanities)

[223]

An Account of the Kings of Kanu'l as Recorded on the Hieroglyphic Stair of K'an II of Caracol

Many queries remain concerning the hieroglyphic stair dedicated in AD 642 by K'an II, the great king of Caracol. The recently discovered panels discovered at Xunantunich contribute greatly to our understanding of this fascinating monument and the tumultuous decades of the Kanu'l dynasty. Thanks to recent discoveries, many gaps have now been closed, with Panels 3 and 4 standing as substantive bookends of this great narrative. These monuments bear witness to the fissioning of the Kanu'l dynasty and its eventual re-establishment at Calakmul, whence it would go on to control much of Classic Maya politics for the remainder of the seventh century. Here we built on earlier studies and add recent observations made through renewed examination of the extant panels.

Helskog, Knut (Professor emeritus)**[111]***Discussant***Hemmings, C. (Aucilla Research Institute)****[238]***Clovis and Pre-Clovis People in Florida: So What Did They Do Once They Got Here?*

The upland portion of Florida's Pleistocene Paleolandscape includes a number of recently dated inundated artifact-rich Clovis and sparser pre-Clovis archaeological sites that contain a wealth of biological information from plant, animal, and micro-organism remains. Human interaction and adaptation to the Pleistocene world around them is stressed for the information we can learn about both that exotic stage, and the players acting upon it, rather than simply pushing back the initial date of when people arrived. Patterns in subsistence practices, technological organization, and paleobiogeography are examined. As last occurrence dates for numerous taxa continue to be dated to the extreme Terminal Pleistocene it is clear there are at least 2,000 years, and arguable thousands more, of human overlap with the now extinct or extirpated species of plants and animals in North and South America. The rarely considered possibility of taboo avoidance of some species is presented as a possible explanation for notable absences at sites with well preserved organics and bone.

Henderson, A. Gwynn (Kentucky Archaeological Survey)**[43]***Discussant*

Henderson, A. Gwynn [129] see Manzano, Bruce

Henderson, A. Gwynn [190] see Pollack, David

Henderson, Lucia**[127]***Chair***Henderson, Lucia****[157]***Fire and Water: Continuities and Contrasts in the Art of Volcanic Regions*

In ancient Mesoamerica, scholars have been able to trace certain deities across enormous spans of time and geography, identifying various consistent, pan-Mesoamerican iconographic tropes. At times, however, this focus on continuity has overshadowed important disjunctions in belief systems and behaviors, particularly those that appear to have arisen in response to specific regional environments. This paper examines the iconography of populations living in volcanic landscapes across Mesoamerica, from central Mexico to El Salvador, to enrich and complicate ideas of religious and iconographic continuity. Using the repeated trope of intertwined fire and water symbolism as an entry point, it examines the ways in which particular, widely-shared iconographies were modified to suit regionally specific needs. Although symbolism related to the duality of fire and water was shared with enormous consistency across Mesoamerica, it finds unique expression in the art of volcanic landscapes. This iconography demonstrates the ways in which distant populations were connected by the shared experience of living in singularly volatile landscapes and how this shared experience differentiated their worldview (and the artistic expression of that worldview) from that of populations living in less violent geographies.

Henderson, Lucia [127] see Woodfill, Brent

Hendrickson, Mitch (University of Illinois, Chicago), Stéphanie Leroy (LAPA-IRAMAT, NIMBE, CNRS, CEA), Enrique Vega (LAPA-IRAMAT, NIMBE, CNRS, CEA), Kaseka Phon (Royal Academy of Cambodia) and Quan Hua (Australian Nuclear Science and Technology Organisa)**[28]***Iron Scales: Reconstructing the History and Organization of Angkorian Iron Smelting around Phnom Dek, Cambodia (Ninth to Fifteenth Centuries CE)*

The Phnom Dek, or "Iron Mountain," in central Cambodia is the center of the largest iron production region in mainland Southeast Asia. Spanning over 1,400 years of metallurgical activity, the most intensive evidence of smelting corresponds with the expansionary phases of the Angkorian Khmer Empire (eleventh to thirteenth centuries). Integrated, multiscale analysis of object, slag mound, site, and landscape using GIS and archaeometallurgical approaches provides new insights into the social organization of smelting communities, the rituals of production, and identity of ironworkers around Phnom Dek.

Hendrix, Jess**[96]***Discussant***Henebry-DeLeon, Lourdes (Central Washington University) and Angela Neller (Wanpum Heritage Center, Grant County PUD)****[49]***At the Table Together: Including Tribes in the Lab from Inventory to Cultural Affiliation*

Cultural affiliation would not be possible without the connections between tribes, museums, and federal agencies. Reliance on each other contributes to a higher standard for a reciprocal and mutual community of practice. By bringing tribes to the table in the lab from inventory to cultural affiliation we advance methods and strategies to accomplish the requirements and intentions of repatriation. Central Washington University and the Columbia Plateau tribes working relationship has led to a joint project that brings data recovered into a large dataset that supports pro-active cultural affiliation on the Plateau. Putting this data within a regional contextual history allows us to identify individual ancestors and their relationships to present day tribes.

Henebry-DeLeon, Lourdes [49] see Neller, Angela

Heng, Piphai [168] see Stark, Miriam

Henkin, Joshua (Field Museum of Natural History)

[258]

Finding and Binding Your Dream Team for Characterizing Plant Exudates: Molle and Other Adventures in Residue Analysis

Everyone knows that interdisciplinary collaboration is the name of the game when it comes to characterizing plant exudates and other archaeological residues. But how do we push the ball forward and become confident that we are producing new insights into material culture from our work in fact rather than engaging in the empty rhetoric of an institutional marketing team? It is possible now, much as has always been the case, to assemble and value teams of people that span the disciplines of analytical chemistry, botany and ethnobotany, archaeology/anthropology, history, and conservation science. More than ever before though, recent innovations in handheld and portable analytical instruments as well as minimally destructive and invasive technologies will permit these collaborations to initiate pilot projects, see meaningful results, and solidify team efforts into long-term materially based research programs focused on plant exudates in cultural heritage objects. One should not forget that this is field and collection-based research, and new tools alone only allow for the possibility of more ideal leverage points with properly trained individuals. There is no substituting hands-on experience with material culture, plants, and people. My studies with *Schinus molle* L. (source of aguaribay resin) and other anecdotes will serve as illustration!

Henry, Aureade (CNRS, University Cote d'Azur), Kelly Graf (Center for the Study of the First Americans, Texas) and Julie Esdale (Colorado State University)

[81]

New Archaeobotanical Data from the Late Pleistocene Occupations of McDonald Creek (Interior Alaska)

What can archaeobotany tell us about past landscapes and human behavior at McDonald Creek during the Late Pleistocene? Since 2016, systematic charcoal and phytolith sampling has been performed at McDonald Creek with the following aims: (1) reconstruct the ligneous vegetation and investigate firewood management practice and (2) test the potential of phytolith analysis to provide not only paleoenvironmental but also paleoeconomic data. The results obtained so far on charcoal and phytolith assemblages from component 1 (Bölling/Allerød interstadial, just after 14,000 ky BP) and 2 (Younger Dryas, around 12,600 ky BP) indicate that the occupations took place within a similar shrub-tundra landscape, while pronounced taxonomic choices operated in favor of willow (*Salix* spp.) for fuel. The phytolith morphotypes identified at McDonald Creek are coherent with the ones found in similar environments. However, some assemblages are characterized by abnormally high proportions of "platelet" and "jigsaw puzzle" morphotypes, indicating a deliberate input of angiosperm leaf material, which could have taken place only during the summer, maybe in order to fulfil specific hearth functions. Thus, our results have important environmental, seasonal, and behavioral implications that are discussed in this poster in light of current archaeological and ethnoarchaeological data.

Henry, Edward [48] see Frachetti, Michael

Hepp, Guy [189] see Joyce, Arthur

Herbster, Holly [63] see Elquist, Ora

Herlich, Jessica (Unity College)

[251]

Taskscapes and Social Sustainability: Archaeobotanical and Ethnohistorical Interpretations from the Chesapeake

The "taskscape," or a landscape comprised of actions and labor (Ingold 1993, 2000), provides a means for assessing the change and continuity of a place over time. Through the study of plant remains (including macrobotanical remains, phytolith residues, and starch grains), taskscapes from the Late Archaic through the Early Colonial era are evaluated in Tidewater Virginia and the Chesapeake. The archaeobotanical data are informed by both the broader archaeological record as well as regional ethnohistories to interpret how these taskscapes might connect with the activities of men, women, and children. This paper seeks to bridge the divide between the pre-Colonial and post-Colonial pasts through the lens of a sustainable society (environment, economics, and social [Brundtland Report 1987; SD2015]). In addition to environmental and economic sustainability, social sustainability likely played an important role in the formation of persistent places, or places returned to over many years of time (Schlanger 1992), in Tidewater Virginia. By considering human relationships within taskscapes, this paper explores social sustainability through activities and tasks associated with the archaeological record.

Hermann, Aymeric (Max Planck Institute for the Science of Human History) and Robert Forkel (Max Planck Institute)
[262]

The Making of Pofatu, a Curated and Open-Access Database for Geochemical Sourcing of Archaeological Materials
 Geochemical fingerprinting artifacts and sources has proven to be the most effective way to use material evidence in order to reconstruct raw material procurement practices, intra- and inter-community interactions, and mobility patterns among past societies. The popularity of geochemical sourcing has led to a large number of projects using various analytical techniques to produce independent datasets. In order to facilitate access to this growing body of data and to promote comparability and reproducibility in provenance studies, we designed Pofatu, the first online and open-access database presenting geochemical compositions for archaeological sources and artifacts in a form that can be readily accessed by the scientific community. This relational database currently houses more than 4000 individual samples from the Pacific Islands, which are comprehensively documented for multidimensional related information, including geochemical compositions, archaeological provenance, and supporting analytical metadata such as sampling process, analytical procedure, and quality control. In this paper, we will present the challenges of collecting both the archaeological and methodological metadata associated with compositional datasets. We will then provide a description of the database content and architecture and will show how to access it via an open access web application.

Hermes, Bernard [128] see Zralka, Jaroslav

Hernandez, Christine (Tulane University)
[138]

The Role of History, Ancestry, and Alliance in the Place of Noxtepec, Guerrero, Mexico
 In the special collections of the Latin American Library at Tulane University is a tracing made by William Spratling of a lienzo map centered upon the town of Noxtepec, Guerrero. Painted by a native tlacuilo around the end of the sixteenth century, this little-known piece exemplifies the carto-historic genre of native map-making that became a popular means by which native towns in New Spain could document their communal history and the ancestry of their leaders in order to keep control of the lands and properties. In this paper, I highlight those aspects of the Lienzo de Noxtepec that speak of a town history that reaches back into the prehispanic period. Exploits like a defeat of the Aztecs, acceptance of Christianity, and fealty to Spanish authority, I contend, helped to enhance the town's standing among its neighbors in an ethnically diverse and dynamic province of the former Aztec empire. Native communities in the Puebla-Tlaxcala region used a similar strategy in later pictorial documents like the Lienzo de Tlaxcala created and encoded with a history of alliance with Cortés and conversion to Catholicism to support claims by native elites to land, privileges, and tribute promised to allies of the Spanish conquistadors.

Hernandez, Christopher (University of Illinois, Chicago)
[265]

The Practice of Maya Warfare: Theoretical and Methodological Implications
 Although studies of warfare are now common in Maya archaeology, much remains to be learned about strategy, tactics, operations, and a myriad of other practical factors in the process of making war. An emphasis on the concrete and practical side of war is necessary to both acknowledge agency and understand how conflict relates to the human experience. As numerous case studies from Eurasia highlight, human actions in the process of making war can have profound impacts on political economy, landscape, and culture. Through an examination of ethnohistoric, iconographic, and archaeological data, I elaborate on practices of Maya fortification construction and how the creation of a martial landscape ties into relations of power during the Late Postclassic/Early Spanish Colonial Period (AD 1200–1600). During this period, in the region of Mensabak, Chiapas, Mexico, Maya peoples fortified a peninsula according to principles of defense-in-depth. In other words, they created layers of fortification to slow and stall an attack. My settlement pattern analysis reveals how the creation of a martial landscape shaped local culture by perpetuating social inequality.

[265]
 Chair

Hernandez, Emely [14] see Krause, Samantha

Hernández, Enrique (Mirador Basin Project, FARES), Richard Hansen (FARES, University of Utah), Carlos Morales (Université Paris 1 Pantheon-Sorbonne, FARES) and Francisco López (Mirador Basin Project, FARES)
[163]

Resultados de las exploraciones y sondeos en el complejo henequen del sitio Tintal, Guatemala
 El sitio arqueológico Tintal ha sido considerado un asentamiento de primer rango ya que alcanzó una monumentalidad y complejidad urbanística que incluye pirámides, palacios tipo acrópolis, plazas, plataformas, calzadas y aguadas dentro del sitio. Las investigaciones presentadas en esta ponencia se focalizaron en el reconocimiento topográfico y en excavaciones preliminares en la Pirámide Henequén, Calzada Jade y Calzada Tintal-Mirador y en otras áreas del Complejo Henequén. Los datos obtenidos de los materiales cerámicos sugieren que los rasgos investigados fueron originalmente edificados y utilizados durante el Preclásico Tardío (400 aC al 150 dC). Además, muestran una interesante reocupación del Complejo Henequén durante el Clásico Tardío (550 al 800 dC) que se extiende hasta el Clásico Terminal (800 al 900 dC) solamente. En resumen, los resultados obtenidos permiten obtener una visión preliminar de los periodos de ocupación de este complejo, y del sitio. La prospección arqueológica en los sitios de los alrededores permite tener una aproximación más amplia sobre el alcance que pudo haber tenido Tintal con sus vecinos más cercanos, la calzada Tintal-Mirador sugiere alguna relación con El Mirador otro centro de poder de primer rango localizado al noreste a unos 25 km de distancia

Hernández, Enrique [163] see Paine, Richard

Hernández Espinoza, Patricia Olga (Centro INAH Sonora)

[144]

Identities and Social Roles: The Main Characters of La Casa del Linaje del Armadillo, Tamtoc, San Luis Potosí

Burials recovered from Structure F7, in Tamtoc, SLP, present a funerary pattern different from those located in other parts of the site. Offerings and associated objects suggest that residents of Structure F7 belong to a different social stratum, loaded with ritual significance. They may be part of one of the ruling lineages of this site. The analysis of this funerary context postulates a hypothesis that the interred may have been part of one of the ruling lineages of this site.

[144]

Chair

Hernandez Godoy, Silvia [173] see Naegele, Kathrin

Hernández Sariñana, Daniela (Boston University)

[150]

Domestic Life and Ceramic Consumption in Tlajinga, Teotihuacan

Tlajinga is the southernmost district of Teotihuacan, a cosmopolite city that thrived in Central Mexico during the Classic Period. Previous research done in this neighborhood includes surface collection associated with the Teotihuacan Mapping Project and the excavation of one compound, designated 33:S3W1 during the '70s. Recent investigations carried out by the Proyecto Arqueológico Tlajinga Teotihuacan (PATT) have yielded new data concerning the ceramic chronology and domestic lifeways in apartment compounds. Two compounds (17:S3E1 and 18:S3E1) were explored beginning 2012 and two platforms that formed part of a barrio center were excavated in 2019. The analysis of ceramics at a household level provides different social insights into provenience, trade and exchange networks, technological changes, consumption patterns, and larger-scale sociocultural preferences. The results from a previous evaluation supported with radiocarbon dates were successful in giving chronologic information about the occupation in Tlajinga. The empirical and archaeometric components of this analysis thus focus on the changes that the ceramic traditions underwent to understand their role in their sociocultural context.

Hernández Sariñana, Daniela [150] see Carballo, David

Hernbrode, Janine [25] see Boyle, Peter

Herr, Sarah (Desert Archaeology Inc.) and Susan Stinson

[1]

Achieving Safe Workplaces in Cultural Resources Management

In this paper we will take a three-part approach to examining and achieving safe workspaces in cultural resource management (CRM), considering demography, reports of harassment and assault in the workplace, and solutions. First, we will provide a snapshot of the participation of women and men in private and public sectors CRM jobs. Second, we will look at who is reporting harassment and try to get a sense of the scale of the problem. Finally, we will discuss solutions, including achieving equity in the workplace, attention to corporate culture, and broadening responsibility for reporting and resolution. We will draw from new and existing datasets and reports, including those of the Society for American Archaeology, the Society for California Archaeology, the Southeast Archaeological Conference, and the American Cultural Resources Association.

Herr, Sarah (Desert Archaeology Inc.), Lynn Gamble (University of California, Santa Barbara), Maria Gutiérrez (UNICEN, Argentina), Geoffrey Braswell (University of California, San Diego) and Hugh Radde (University of California, Santa Barbara)

[72]

Assessing Diversity in the Society for American Archaeology Journals

The three peer-reviewed journals of the Society for American Archaeology, *American Antiquity*, *Latin American Antiquity*, and *Advances in Archaeological Practice* are available to all members of the SAA electronically, but have different readerships, distinct submission bases, and individual cultures of practice and production. The editors share a desire to increase diversity and achieve equity along a variety of different axes. In this presentation, we share data—as available—about gender and geographic diversity in submission rates, publication rates, peer review, and readership. As we consider what is behind these trends and comment on our successes, attempts, and failures, we ask for a broader study of equity in archaeological practice and publication so that our journals, in the future, will better reflect the membership of the Society and the global archaeological community.

Herr, Sarah (Desert Archaeology, Inc.)

[154]

Discussant

Herrera, Eric [119] see Gaylord, Donald

Herrera-Santos, Yoanna [133] see Elliott, Michelle

Herrera-Schneider, Alexandra [238] see Evans, Amanda

Herrmann, Nicholas [35] see Cook, Jacob
 Herrmann, Edward [198] see Cory, Mackenzie
 Herrmann, Edward [232] see Flood, John
 Herrmann, Edward [175] see Friberg, Christina
 Herrmann, Nicholas [215] see Rodriguez, Katherine

Herron, Molly (University of Wyoming), Todd Surovell (University of Wyoming) and Madeline Mackie (University of Wyoming)
[270]

Identification of Fragmented Mammoth Ivory in Archaeological Sites Using SEM Microscopy

Although mammoth ivory appears distinctive from other organic materials when found in large pieces, many morphological characteristics that distinguish ivory—such as Schreger lines—cannot be easily identified with small fragments. However, other characteristics, including dental tubules and canals, can be microscopically identified. In this study I attempt to establish a methodology for identifying sub-centimeter ivory fragments using a Scanning Electron Microscope (SEM). After blind testing this method, I will then apply it to the fragmentary faunal remains from the La Prele Mammoth site, a Clovis mammoth kill/scavenge and camp from Converse County, Wyoming. If fragmentary pieces of ivory are identified in multiple excavation blocks, this would suggest that the Clovis occupants were sharing ivory across the site. The identification of sub-centimeter ivory has applications at other archaeological sites with fragmentary faunal collections.

Herron, Molly [65] see Dersam, Sari

Hertfelder, Paula (Binghamton University), Alejandra Abrego (Instituto Nacional de Antropología e Historia) and Cinthia Campos (Binghamton University)
[147]

Integrating UAV-based Photogrammetry, Digital Data Collection, and GIS during the Trincheras Tradition Project Excavations

The Trincheras Tradition Project is an ongoing collaborative effort to better understand the prehispanic past of Northwest Mexico. Led by Dr. Randall McGuire and Elisa Villalpando, researchers from Binghamton University and the Instituto Nacional de Antropología e Historia (INAH) spent two field seasons in 2017 and 2018 excavating three Trincheras Tradition sites in Sonora, Mexico: El Póporo, San Martín, and La Potranca. This project involves the first intensive excavations of Trincheras sites dating before 1200 AD. This poster documents how project researchers integrated an Unmanned Aerial Vehicle (UAV), Filemaker, and ArcMap to photograph and map features and artifacts during archaeological excavation. UAV photogrammetry provided aerial imagery and a digital elevation model of each site. In addition, the UAV provided high quality images of features. All feature maps were drawn digitally with tablets in the field and georeferenced into ArcMap. Other data from artifact, soil, and pollen analyses are also designed to be joined with the project GIS. Integrating these technologies allowed for more streamlined data entry and improved visualization of spatial information.

Herzner, Louis (University of Cincinnati), Kenneth Barnett Tankersley (University of Cincinnati), Dylan Zedaker (University of Cincinnati), Maddie Moeller (University of Cincinnati) and Larry Sandman (University of Cincinnati)
[63]

Extracting Micro-meteorites and Micro-tektites from Archaeological Contexts

This poster describes a new standard protocol for extracting high-temperature cosmic airburst related magnetic spherules (i.e., micro-meteorites) and melt-glass (i.e., micro-tektites) from bulk archaeological sediments. Aliquots are first collected from well-dated, stratified archaeological sites and labeled by depth and archaeological context. In the laboratory, the aliquots are weighed and slurries are created by mixing the bulk sediment with water. The magnetic grain fraction is then extracted using rare earth neodymium magnets enclosed in a removable plastic sleeve. Once magnetic samples have been extracted the plastic sleeve is removed, separating the samples from the magnet. A deflocculant (hydrogen peroxide, H₂O₂) is used to wash the samples from the plastic sleeve into a petri dish. A stir-bar is added to the petri dish to agitate the samples in the slurry and separate the cleaned magnetic samples. The samples are then left to dry to be analyzed under the microscope. Additional sieving of the original slurry is used to collect non-magnetic micro-meteorites and micro-tektites. Micro-meteorites and micro-tektites morphologies are identified using light microscopy followed by scanning electron microscopy (SEM) and energy dispersive analysis of X-rays (EDAX) is used to determine elemental composition.

Herzner, Louis [63] see Zedaker, Dylan

Herzog, Hunter (Indiana University-Purdue University, Indianapolis) and Brooke Drew
[167]

Early Settlers of Central Indiana: The Historical Background of Decatur Township and the Bethel Cemetery

Before Bethel Cemetery (ca. 1827–1935) was excavated in the summer of 2018, it was understood that an important part of the cemetery relocation project would be the construction of a historical narrative that would assist in contextualizing the lives of those buried at the site. In the early-to-mid nineteenth century, central Indiana was part of the American frontier and a difficult place to live with survival predicated on high resolve and an unmatched level of perseverance. This paper will investigate the lives of the earliest settlers and provide a historical background for Decatur Township, Indiana, home to the Bethel Methodist Episcopal Church and Cemetery. In addition to describing the growth of Decatur Township and the Bethel Church, we will also examine a few of the more

prominent citizens of the township, many of whom were interred at Bethel; this includes several veterans of the Indian Wars, War of 1812, and Civil War. The individuals described played major roles in the development and success of the community and provided their fellow settlers with both spiritual and physical sanctuary.

Herzog, Nicole [235] see Louderback, Lisbeth

Hess, Erin

[256]

Public Outreach and Engagement as Mitigation

The mission of the U.S. Army Corps of Engineers' (Corps) Regulatory Program is to protect the Nation's aquatic resources while allowing reasonable development through fair and balanced permit decisions. The Corps works with consulting parties to develop appropriate mitigation measures when adverse effects to historic properties cannot be avoided. Mitigation measures usually include additional archival and archaeological research and other documentation, including measured drawings and large-format photography, of historic properties. While the submittal of records to the Library of Congress through Historic American Engineering Record, Historic American Building Survey, and Historic American Landscapes Survey documentation makes the records available to the public, other archival and archaeological research is often relegated to "grey literature." This presentation discusses the need to include public outreach and engagement as a standard mitigation measure to accompany archival and archaeological research. It also discusses approaches to sharing information to ensure that new research is incorporated into the literature and is made available to the public and other researchers to ensure the context of future research is based on the most current information available. Several methods for maintaining the availability of shared information once the initial outreach is conducted are discussed to ensure continued learning and engagement.

[256]

Chair

Hester, Thomas (Emeritus) and Michael Glascock (University of Missouri)

[267]

Ongoing Studies of Obsidian from Texas Archeological Sites

The Texas Obsidian Project was initiated almost 50 years ago. Obsidian artifacts are rare in Texas sites, and since there are no obsidian sources in the state, a continuing effort has been made to determine the geologic sources of each specimen. Techniques used include XRF and NAA, working first with the Lawrence Berkeley National Laboratory, and in recent years, with the Archaeometry Laboratory, University of Missouri. Overall, most Texas obsidian has been linked to localities in the Jemez Mountains of New Mexico and to the Malad (Wright Creek) source in Idaho. However, distant sources including several in central and western Mexico, as well as a few artifacts from scattered locales in the western United States, have also been recognized. The Mexican sources offer a promising line of research, greatly enhanced in the past decade. For example, obsidian artifacts have been found in the Rio Grande Delta and southern parts of Texas, dating from Clovis times into the Historic era. Thus far, one principal route has been defined for the movement of the Mexican material into Texas. Mexican sources in western Mexico, identified by Michael Glascock, represent long-distance interactions that we cannot yet identify.

Hickey, Kristen [241] see Jones, Ashley

Hiep, Hoang Trinh [199] see Adams, Alisha

Higgins, Howard (TRC Environmental Corp.), Brenda Ireland (First Light Initiatives) and Sandra Marion (Tahltan First Nation Central Government)

[97]

A View from the Bridge: The Role of Anthropological Consultation in the Twenty-First Century

Many indigenous groups that underwent colonialism and forced acculturation are in the process of repatriating their traditional knowledge and culture, and reclaiming their unique identities, social structures, governance and legal structures. In Canada, this process of self-determination is within the context of the United Nations Declaration on the Rights of Indigenous Peoples which the Canadian government officially adopted in May 2016, and more generally under Canada's Truth and Reconciliation Commission's 94 Calls to Action (December 2015). Such action is being undertaken by the Tahltan, a First Nation whose people live in northwestern British Columbia. As a step toward reclaiming and repatriating Tahltan knowledge, they are reviewing the historical record to identify what outsiders observed about Tahltan culture, values, social structure, and cultural practices. This effort is being directed by Sandra Marion, Director of Culture and Heritage for the Tahltan Central Government; the Principal Consultant (the "Bridge") is Brenda Ireland. The paper presents the goals and methodology of this work, identifies problems found during its promulgation, and concludes with recommendations for those involved in such efforts in the future.

Hildebrand, Elisabeth (Stony Brook University), Katherine Grillo (University of Florida), Anneke Janzen (University of Tennessee, Knoxville), Elizabeth Sawchuk (Stony Brook University) and Susan Pfeiffer (University of Toronto)

[171]

Buffering New Risks? Social and Economic Changes around Lake Turkana, Kenya 5000–4000 BP

As the African Humid Period ended, rainfall in eastern Africa decreased and Lake Turkana shrank dramatically 5300–3900 BP. Retreating shorelines and arid-adapted vegetation transformed local landscapes, and environments became less predictable.

Economies shifted from food procurement (fishing/hunting aquatic resources) to food production (herding), likely through both immigration by pastoralists and adoption of herding by local fishers. Early herders built six megalithic pillar sites that served as communal cemeteries. Temporal association between environmental, economic, and social changes might lead one to propose that early herding and monumental architecture were adaptive responses to heightened risk. Classic risk-buffering strategies include mobility, diversification, physical storage, and exchange (Halstead and O'Shea 1989). Around Lake Turkana, economic shifts from fishing to herding could have entailed diversification and/or increased mobility (though not necessarily). As fixed landmarks in an unstable landscape, pillar sites could have provided settings for congregation and exchange. However, risk buffering is just one potential explanation for these new practices. Gauging its applicability requires (a) assessing the spatial mobility of communities and individuals interred at pillar sets, (b) evaluating whether (and if so, how) mobility strategies changed as pastoralism supplanted fishing, and (c) examining alternative explanations for social and economic changes in middle Holocene Turkana.

Hill, Austin (Dartmouth College), Elise Jakoby Laugier (Dartmouth College), Jesse Casana (Dartmouth College), Mark McCoy (Southern Methodist University) and Kelsey Reese (University of Notre Dame)

[147]

Archaeological Prospection using Drone-Acquired Lidar: Benefits, Limitations, and Results

Aerial Lidar is increasingly recognized as the go-to technology for archaeological remote sensing in heavily vegetated areas, yet the extremely high cost and logistical difficulty of Lidar surveys with full-scale aircraft has limited access to this technology for most archaeologists. Instead, researchers generally rely on publicly available lidar data, which are often of relatively low resolution. However, small and lightweight Lidar sensors, designed specifically for use on drones, are increasingly affordable, functional, and accessible alternatives. While these sensors suffer from a number of limitations, they do allow archaeologists to capture their own Lidar data efficiently and with sufficient resolution to identify and record archaeological features that would be otherwise inaccessible. This paper presents the results of drone Lidar surveys at sites in Hawaii, Colorado, and New Hampshire and discusses the current capabilities and constraints of this technology.

Hill, Catherine (Smithsonian), Molly Kamph (Smithsonian) and Michael Frank (Smithsonian)

[185]

Securing a Legacy: Examining the Dennis Stanford Paleo-Indian Collection Project

In 2019, the Smithsonian Institution's National Museum of Natural History's Department of Anthropology began a collaborative project through the Smithsonian's Collections Care and Preservation Fund aiming to inventory the archival and artifact collections of late Paleo-Indian archaeologist Dr. Dennis Stanford. Through a team of professionals encompassing expertise in Stanford's career and collections, museum practice, and archives, the project continues the Smithsonian's collections strategy of maintaining the association between archaeological collections and metadata during the inventory and eventual cataloging and processing phases to increase the collection's value to future researchers and the public. The project will further establish Dr. Stanford's legacy by establishing the Dennis Stanford National Paleo-Indian Collection, a preeminent national resource for Paleo-Indian scholarship, while making his work more accessible and allowing future researchers to further the field through engagement with Dennis Stanford's collections. The poster will highlight the Dennis Stanford Paleo-Indian Collections Project's goals, methodologies, and challenges as well as encourage discussion about the preservation, physical and intellectual accessibility, and legacy of archaeological artifacts and records while highlighting the incredible career of one of Paleo-Indian archaeology's greatest voices.

Hill, Ethan [80] see O'Donnell, Lexi

Hilliard, Jerry [107] see Lockhart, Jami

Hillman, Aubrey [59] see Contreras, Daniel

Hillman, Aubrey [125] see Vining, Benjamin

Hillman, Samuel [119] see Alarcón Tinajero, Edgar

Hills, Kendall (University of Illinois at Chicago)

[28]

Sandstone Temple Survey in the Northwest Provinces of the Angkorian Khmer Empire: Preliminary Results of the 2019 Field Campaign

Situated between Cambodia's Tonle Sap to the south and the Kulen Hills in the north lies the capital of Angkor—the heart of the Angkorian Khmer empire (ninth–fifteenth centuries CE) and the largest preindustrial urban center in the world. Due to the large corpus of monumental architecture found within the capital of Angkor, research has traditionally been heavily geographically focused on this imperial core. Such regionally constricted research, however, has produced a narrow perspective of early imperial craft in Cambodia. Recognizing the limits of core focused archaeology, scholars have begun to extend their research beyond the capital of Angkor and to situate their investigations in the provinces of the empire. This paper discusses the preliminary findings of a sandstone temple survey performed in the northwest modern Cambodian provinces of Battambang, Banteay Meanchey, and Oddar Meanchey. These contiguous provinces are situated beyond what is considered the imperial core yet are regularly depicted as part of the Angkorian Khmer Empire. The overall objective of the 2019 Field Campaign was to collect metric data from regional sandstone temples in order to provide insight into the imperial experience from the perspective of provincial intermediate elites, via the analysis of their monumentality.

Hilo, Regina (SHPD Hawaii)**[262]***Legacy Data within a Regulatory Agency Framework: Hawaii's State Historic Preservation Division*

As a regulatory agency, the State Historic Preservation Division (SHPD) of Hawaii reviews projects for compliance with Hawaii Revised Statutes Chapter 6E and the National Historic Preservation Act. This paper will discuss origins, challenges, and favorable outcomes to address our legacy data.

Hinkelman, Sarah (Ohio State University), Benjamin Cross (Ohio State University) and Robert Cook (Ohio State University)**[221]***Iron Men and Earthen Mounds: Effects of Monumentality on Historic Narratives*

How history is presented shapes the way that we perceive our world. Specifically, the way individuals experience the landscape around them affects their values, beliefs, and worldview. Monuments are key elements within landscapes which impact the values of a cultural group, as they are central to transferring shared memories across time. Monuments, however, usually only tell a limited version of history. Whoever has control of history can legitimize or ignore the narrative of the past that they prefer. However, such biased interpretations have lasting impacts on public perception and consequently the decisions and behaviors of individuals. In this study, we look at two cases in which the interpretation of monuments creates conflict over how the past is presented to the public. Confederate monuments in the southern United States have long been used to establish and maintain a Lost Cause Mythology that reinforces racial inequality. Similarly, the selective presentation and access of ancient earthworks can be at odds with the wishes of living Native American populations. We argue that as we move forward, as archaeologists and museum specialists, we must evaluate the way that we present and control narratives to encourage multivocality and push interpretations based on established facts and evidence.

Hinton, Sarah (Texas State University) and Kelsey Hanson (University of Arizona)**[122]***Let's Get Crafty: Social and Spatial Organization of Craft Specialization in the Aftermath of Migration*

Migration fundamentally restructures social relationships between migrants and host communities. Recent research in the U.S. Southwest demonstrates that migrant craft specialists use their skills in crafts to position themselves in their new communities. Recent excavations at the Gila River Farm site in the Cliff Valley of western New Mexico reveal important information about interactions between local populations and migrants from the Kayenta region of northeastern Arizona. Distributions of ground stone, ceramics, and mineral samples suggest spatially restricted production activities at the site. We focus here on the intrasite level organization of craft production, namely production tools and associated debris, to examine the spatial organization of craft production—especially pottery and ornament production—to examine social relationships between migrant and host communities.

Hipskind, Scott [232] see Flood, John

Hiquet, Julien (Université de Paris 1 Panthéon-Sorbonne)**[20]***From the Quarry to the Building: Stone Procurement, Distance Transportation, and Cost Simulation at Naachtun (Petén, Guatemala)*

In the Maya Lowland, quarrying marks left on the bedrock surface are often found literally at the foot of residential or public buildings. In general, Maya builders used to extract stone building materials as close as possible to construction sites. This trend has also been noted in the Classic Maya center of Naachtun (Petén, Guatemala), where many quarries are located in the immediate vicinity of monumental buildings. Nevertheless, various platforms and pyramids were built upon—and surrounded by—plazas that physically prevented such a nearby extraction. Large quarries situated at some distance from any construction and in off-site areas are also known in many Maya sites. One would therefore assume that these quarries have been carefully selected for their potential to provide the huge volumes of stone required to raise such massive platforms and pyramids. Using an architectural energetics approach, I will test this hypothesis by simulating various scenarios for stone procurement at Naachtun and attempt to measure and evaluate the impact of the distance between quarries and construction sites on construction costs.

Hiquet, Julien [102] see Arnauld, M. Charlotte

Hirniak, Jayde (Arizona State University)**[38]***Chair*

Hirniak, Jayde [38] see Cabadas, Horacio

Hirschfeld, Nicolle [175] see Martin, Samuel

Hirth, Kenneth [133] see Andrews, Bradford

Hiscock, Peter

[253]

Lithic Raw Materials and Morphological Variation, a Small Example

Microliths are often thought to be standardized hunting weapons, but in Australia the evidence points to them being used in craft production of organic tools and paraphernalia. It has been argued that these tools also operate to send public signals and that this accounts for their standardization. But how standardized are they and how does regularity of shape come to be constructed on quite different raw materials? In this paper, I use geometric morphometrics to study these questions on a large sample of microliths from a desert region. The results shed light on the ways these technologies were organized.

Hitchings, Philip (University of Toronto) and Edward Banning (University of Toronto)

[55]

The Use of Bayesian Allocation for the Optimization of Archaeological Survey Effort

For many archaeological surveys, it is critical to record not just the most common sites, but rare and unobtrusive ones. While surveyors use predictive models to accomplish this, they have previously ignored the very useful method of Bayesian allocation, which maximizes the probability of finding sites with a fixed cost. Bayesian allocation, originally developed for searches during WWII, determines the optimal solution for distributing available search effort by exploiting prior probabilities that spaces contain "targets." These probabilities are updated with new information as survey proceeds, in an iterative fashion. No other method so efficiently directs survey effort, or directs repeated survey in the same space on the basis of posterior probabilities. Our use of this approach successfully discovered rarely found Epipalaeolithic and Early Neolithic sites in Cyprus and Late Neolithic sites in Jordan, sometimes after survey of the same space multiple times. Some of these sites would have escaped detection in surveys that only searched each space once. Furthermore, typical surveys may waste effort searching spaces not likely to contain sites. The Bayesian approach could be particularly useful in CRM, to minimize the chance that surveys fail to discover sites that are significant, unobtrusive, and at risk of destruction.

Hixon, Sean (University of California, Santa Barbara), Kristina Douglass (Pennsylvania State University), Lucien Rakotozafy (l'Institut de Civilisations/Musée d'Art et d'Archéologie), Brooke Crowley (University of Cincinnati) and Douglas Kennett (University of California, Santa Barbara)

[76]

Past Temporal and Dietary Overlap among Introduced and Extinct Endemic Herbivores in SW Madagascar

Early human colonists of Madagascar encountered a diverse endemic fauna that included elephant birds, pygmy hippopotamuses, and giant tortoises. All species >10 kg went extinct by ca. 1000–500 years ago. Hunting and anthropogenic landscape transformation help explain aspects of the extinction pattern. Competition between introduced bovids and endemic herbivores may have also played a role, but its contribution is uncertain due to poorly constrained times of past species introductions and limited information regarding the diets of past introduced species. We present radiocarbon and stable carbon and nitrogen isotope ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$) data from the bulk bone collagen of introduced cattle (*Bos indicus/taurus*) and sheep/goats (*Ovis/Capra* spp.), as well as endemic hippos (*Hippopotamus lemerlei*) and tortoises (*Aldabrachelys* spp.) from sites in southwestern Madagascar. Radiocarbon dates confirm that introduced and endemic herbivores overlapped chronologically in this region between at least 800 and 1000 calendar years before present. Stable isotope data suggest that sheep/goats, tortoises, and hippos had broadly similar diets and foraged in similar habitats. However, the $\delta^{13}\text{C}$ data also suggest that cattle and sheep/goats exploited a wider range of plant types than endemic herbivores. These data thus support the potential for past exclusion competition between introduced and endemic herbivores.

Hixson, David (Hood College) and Jeffrey Vadala (College of New Jersey)

[175]

Unreal Archaeology: From Low-Cost Drone Imagery to Rapid VR Simulation at the Ancient Maya site of Chunchucmil, Yucatán, Mexico

As detailed 3D models of archaeological sites and features have become the desired method for surveying and interpreting the cultural landscape, most techniques for achieving this result remain either too labor intensive or beyond the technological capacity for the everyday archaeologist. Solving this issue, we have developed a flexible, low-cost, and rapid methodology for the creation of stunning 3D models using off-the-shelf consumer-grade hardware, widely available software, and requiring very little experience in 3D modeling. We demonstrate our methodology in the context of ancient Maya archaeology, utilizing inexpensive drone photography to develop research-quality digital surface models, digital terrain models, and fully immersive Virtual Reality experiences covering a portion of the ancient Maya city of Chunchucmil, Yucatán, Mexico. The addition of VR to this process produces data products that are more impactful, more intuitive, and provide greater flexibility for a wide range of archaeological research. Opportunities to view the resulting 3D models in VR will be made available following the presentation.

Hodgetts, Lisa (University of Western Ontario), Kisha Supernant (University of Alberta), Natasha Lyons (Ursus Heritage Consulting) and John Welch (Simon Fraser University)

[1]

An Intersectional Analysis of Responses to the Equity and Diversity in Canadian Archaeology Survey

Since its first use by Kimberlé Crenshaw in 1991, intersectionality has emerged as a potent lens for identifying and tool for disrupting ways that multiple identity categories converge to influence individual access to power. Our 2019 online survey of Canadian archaeologists gathered information from over 550 students and practitioners. It explored experiences of sexual and nonsexual forms of harassment, violence, discrimination, and exploitation in field, institutional, and other professional settings across all disciplinary sectors. It also collected information on respondents' gender, sexual orientation, ethnicity, age, and seniority, providing an opportunity to explore how intersections of identity impact people's experiences in the discipline. Preliminary analysis indicated

some clear trends based on gender, career stage, and sector. In this paper, we deepen our analysis to look at intersecting identities, including how respondents reacted to our framing of questions of gender, sexual orientation, and ethnicity, as well as present data about how intersections of identity increased or decreased the vulnerability of Canadian archaeologists to negative experiences. We nuance quantitative analysis of the survey responses with qualitative data from survey respondents representing a diverse set of demographics.

Hodgetts, Lisa (University of Western Ontario), Natasha Lyons (Ursus Heritage Consulting), Rebecca Goodwin (University of Western Ontario), Jeffrey Grieve (University of Western Ontario) and Jason Lau (University of Western Ontario)

[64]

Digital Co-creation in the Inuvialuit Living History Project

The Inuvialuit are the Inuit of the Canadian Western Arctic, a community with a long history of documenting their knowledge and cultural experiences through oral transmission, publishing, film, and novel communication technologies. The Inuvialuit Living History Project is a long-standing community-based partnership, which has worked to create better access for Inuvialuit to cultural materials housed in southern repositories and to represent living cultural traditions in real and digital spaces. We currently focus on bringing together Elders and youth to share and learn land-based knowledge and traditions and to document these experiences using digital tools including interactive maps, photospheres, and digital graphic arts. These tools open space for collaborative meaning-making as we connect longstanding traditions and pedagogies to the present and shape desired futures. This poster highlights land- and town-based cultural events hosted by the project, illustrating how different technologies fostered knowledge transmission between Inuvialuit generations in these settings. It also outlines how we will use digital media co-created by Elders and youth to re-imagine our project website (www.inuvialuitlivinghistory.com). Finally, it explores the interrelationships and tensions between knowledge creation, traditional pedagogy, and the practice and sharing of living cultural traditions in digital and real-world contexts.

Hodgins, Gregory [119] see Bethke, Brandi

Hodgins, Gregory [135] see Kessler, Nicholas

Hodgkins, Jamie [38] see Keller, Hannah

Hoedl, Lucas [135] see Kessler, Nicholas

Hoffman, Brett [188] see Jamison, Gregg

Hoffman, John [229] see Morgan, Linda

Hoffman, Megan (University of Indianapolis)

[167]

Estimating Sex in Subadults from the Bethel Cemetery, Indianapolis, IN, via Dental Metric Dimorphism

The Bethel Cemetery is a historic church cemetery that yielded 543 individuals, containing a large portion of subadult remains. This study used odontometrics from known male and female adults from the Bethel Cemetery to estimate sex of Bethel subadults with permanent teeth via a three-step discriminant function analysis (DFA). Intraobserver error found there were no significant differences between measuring episodes ($t = 0.533$, $p > 0.05$, $df = 23$). Interobserver error found there were no significant differences between observers ($t = 0.088$, $p > 0.05$, $df = 23$). First, a Primary DFA was used to build a model of the adults to determine dimorphism classification accuracy. The DFA that best classified individuals consisted of 5 measurements (MDcerv_LC, BLcerv_LC, BLcerv_UC, MDcerv_UC, and MDcerv_LP4) at 87.9% correct classification. Second, a Verification DFA tested sex estimation of the known subadults. By adding BLcerv_UP4, more known subadults were successfully classified. Of the known subadults, 12 out of 13 classified into their correct male and female groups. Lastly, the 6 measurement DFA was applied to the unknown children for sex estimation. These findings provide a way to estimate sex of immature remains with up to 88% confidence. Without the use of dental metrics, estimation of sex to Bethel's unknown children would otherwise not be possible.

Hoffman, Nancy (Minnesota Historical Society)

[56]

Janet D. Spector

Janet Spector is best known for her groundbreaking work in Feminist Archaeology and collaborative research but she also made significant contributions beyond Archaeology. Spector helped form the Women's Studies Department at the University of Minnesota in 1973, the first in the nation to offer a major in women's studies and in the wake of *Rajender v. University of Minnesota* (a landmark class action lawsuit dealing with sexual discrimination in the academy), she was tapped by university administrators to head a special Commission on the Status of Women. Using an anthropological approach, Spector began a series of ethnographic interviews with faculty, staff, and students to evaluate conditions in order to improve the campus climate. In all of her work, Spector sought to challenge existing structures of knowledge; she used the same integrated, multivocal approach that characterized her work in Archaeology.

Hofman, Corinne [271] see Shev, Gene

Hofman, Courtney [244] see Singleton, Robin
 Hofman, Courtney [169] see Wright, Sterling

Hofman, Jack (University of Kansas) and Barbara Crable (R. C. Goodwin and Associates)

[68]

Bison Hunting Using Bottlenecks and Funnells during Folsom Time: The Bethel Locality, Western Oklahoma

The narrow divide between the Canadian and Washita rivers in west central Oklahoma is the location of multiple historic transportation routes. These routes followed a game trail which was a focal point for prehistoric hunting. Prominent buttes provide overlooks while spring-fed and wooded canyons offered protected habitation and hunting opportunities. This combination of landscape features along the narrow Bethel divide, made the locality ideal for pedestrian bison hunting. We argue that this locality was used intensively from early prehistory through the contact period for intercept bison hunting. Other settings with these landscape features in the plains region were probably used in a similar fashion, and a few examples are offered. Here we summarize Folsom evidence which represents the early period of bison hunting in the region. Points, preforms, and lithic materials in the Bethel locality are documented and brief comparisons are made between Folsom and other periods.

Hofman, Jack [236] see Rapes, John

Hoggarth, Julie (Baylor University), Claire Ebert (Northern Arizona University), Leszek Pawlowicz (Northern Arizona University), John Walden (University of Pittsburgh) and Jaime Awe (Northern Arizona University)

[230]

Energetic Investment in Agricultural and Water Management Landesque Capital in the Belize River Valley

New applications in lidar remote sensing have revolutionized what we know about the scale of settlement density and urban planning of the ancient Maya. Despite these advances, fewer studies have focused on using lidar to examine the social dimensions of intensive agricultural cultivation. Here we apply spatial analyses of lidar data from the Belize River Valley to estimate the energetics of constructing and maintaining landesque capital related to intensive agricultural production and water management. We focus on the southern foothills of the Belize River Valley, identifying the size and extent of terraces, ditches, and aguadas and discuss the implications of population size for their construction.

Hoggarth, Julie [178] see Saldaña, Gabriela

Holcomb, Justin (Boston University), Karl Wegmann (North Carolina State University) and Panagiotis (Takis) Karkanas (American School of Classical Studies)

[195]

Identifying the Younger Dryas in the Northern Great Basin using Soil Micromorphology: A View from the Connley Caves, Oregon

The Younger Dryas Chronozone (YDC) was a cooling event occurring 12,900–11,600 years ago (cal BP) marked by rapid changes in plant and animal communities, subsequently affecting late Pleistocene human population organization and settlement dynamics across the globe. In North America's Northern Great Basin, these changes appear to have positively affected mobile foragers, but a lack of well-dated archaeological sites in the region hinder our ability to test this hypothesis or to adequately understand its role in shaping the archaeological record. Thus, there is a need for more datable archaeological occupations and high-resolution studies of Pleistocene-aged deposits in the region. At the Connley Caves, located in the Fort Rock Basin, Oregon, stratified deposits have yielded rich Western Stemmed Tradition assemblages spanning the YDC, providing a unique opportunity to address this issue. We present ongoing geoarchaeological research at the Caves, and discuss both the macro- and microscopic characteristics that help define the YDC. These data provide one approach to disentangling human-environment dynamics taking place during the late Pleistocene and early Holocene transition.

Holcomb, Justin (Boston University)

[219]

Moderator

[219]

Discussant

Holcomb, Justin [170] see Jenkins, Dennis

Holcomb, Justin [66] see Quiroz, Itzel

Holdaway, Simon [162] see Coco, Emily

Holen, Kathleen (Center for American Paleolithic Research) and Steven Holen (Center for American Paleolithic Research)

[75]

Human-Induced Percussion Technology: A Synthesis of Bone Modification as Archaeological Evidence

Prey animal bone modification by humans has long been part of the archaeological record; however, debate continues as to whether this evidence alone is sufficient to justify interpretation of technological activity. This is especially true if such evidence is used in support of archaeological sites older than 16 ka in the Americas. This poster synthesizes data that represent over a decade of research including experimental bone breakage and archaeological excavations of proboscidean assemblages. Replicable features of percussion and use wear patterns on bone elements are described along with interpretive methods which demonstrate analogous, concurrent and anomalous patterns that represent human behavior. Geological contexts that rule out alternative causes

of percussion breakage are described. We conclude that features of bone modification by percussion can be strong evidence of human behavior when interpreted in the light of experimental reference samples, analogous archaeological sites and geological context. The age and geographic location of a site does not invalidate this evidence.

Holen, Kathleen [170] see Holen, Steven

Holen, Steven (Center for American Paleolithic Research) and Kathleen Holen (Center for American Paleolithic Research) [170]

The Mammoth Steppe Hypothesis: New Evidence Concerning Pre-Last Glacial Maximum Humans in the Americas

In 2013, Michael Collins and colleagues wrote a book chapter titled "North America Before Clovis: Variance in Temporal/Spatial Cultural Patterns, 27,000–13,000 cal yr BP". In the same book we offered a similar view of the early peopling of the Americas titled "The Mammoth Steppe Hypothesis: The Middle Wisconsin Peopling of North America" suggesting a 40,000–20,000 cal BP peopling event. These two chapters differed somewhat in describing the early colonization event. Collins emphasized the coastal route and we proposed a land-based entry, these two hypotheses are not mutually exclusive. However, both models were quite similar in the time frame and assertion that people had been in the Americas long before Clovis. Here we update the evidence from North America supporting the Mammoth Steppe Hypothesis and include new data from South America that indicates an early human occupation there. Collins closing statement that "The diversity of the tool kits and the attendant lifestyles at the sites discussed herein point toward multiple movements by different groups at different times via different routes into the New World well before the Clovis temporal benchmark" is relevant today. Ongoing research supports this viewpoint.

Holen, Steven [75] see Holen, Kathleen

Holland, Russell [196] see Iñáñez, Javier

Hollenback, Kacy [119] see Thimmig, Rachel

Holley-Kline, Sam (Florida State University)

[57]

Beyond Sites and Communities: GIS Counter-Mapping and Indigenous History in El Tajín, Mexico

In Mexico, much state-sponsored archaeology has focused on the excavation and reconstruction of monumental urban sites to understand their prehispanic occupations. While archaeologists and ethnographers increasingly look to "local communities" for differently-situated understandings of the past, the "local" category has been subject to extensive theoretical critique. In this paper, I discuss the use of a GIS-based counter-mapping methodology as a means of both rethinking the site-community distinction and productively de-centering archaeological knowledge in favor of the histories relevant to indigenous communities. Based on a counter-mapping study conducted in El Tajín, Mexico, I argue that mapping historic routes of access—trails called caminos reales—constitute the most locally-salient means of defining the cultural landscape, rather than a combination of archaeological site and local community. From there, I discuss the local histories elucidated during the counter-mapping process. In the case of El Tajín, counter-mapping illustrates the importance of local landscape features—particularly the cerro de Trakátlok—for understanding the pasts relevant to area residents. I conclude by arguing for the broader applicability of the method.

Holliday, Trenton, Christelle Lahaye (Université Bordeaux Montaigne), Maxime Pelletier (University of Oulu), Brice Lebrun (Université Bordeaux Montaigne) and Guillaume Guérin (Université Bordeaux Montaigne)

[36]

The French Mousterian site of Regourdou: First Synthesis of Different Absolute Dating Investigations

In 1957, a Neandertal skeleton was discovered at Regourdou. Bonifay's 1961 to 1964 excavations defined the site's lithostratigraphy (layers 8 to 1 bottom to the top). He associated the Neandertal with layer 4 that also yielded roe deer, wild boars, brown bears and Mousterian lithics, arguing layer 4 dated to MIS 5. Since 2013, we have sought new absolute ages: C14 (faunal remains in layer 2), 230Th/234U for a stalagmite (atop layer 3) and a speleothem (interface between layers 3 and 4), and OSL and IRSL for layers 3 and 4. Reindeer from layer 2 are 33–43 kyr cal BP while hares are 42–45 kyr cal BP; the site functioned as a natural faunal trap. AMS dates (31–42.5 kyr cal BP) show rabbit burrowing during isotopic stage 3. The stalagmite atop layer 3 was contaminated with exogenous Th, and therefore could not yield reliable Th/U results. Nevertheless, four attempts on the speleothem gave a corrected age from 77.9–82.9 kyr. OSL and IRSL dates show layer 3 is ca. 80 kyr, and OSL results for layer 4 are ca. 91 kyr, thus stage 5c. We now consider Regourdou 1 to be the best-preserved and earliest associated fossil from Western Eurasia.

Holliday, Vance (University of Arizona), Bruce Huckell (University of New Mexico) and Peter Condon (Versar Inc.)

[68]

Folsom Archaeology and Geoarchaeology along the Rio Grande Basin, Southwestern USA

Folsom lithic assemblages are the most common Paleoindian manifestation in the basins of the Rio Grande Rift, from south-central Colorado to southern New Mexico. Most of the sites represent single-component Folsom occupations, but some are multiple-component Paleoindian sites. Most are on the surface or shallowly buried, found along drainages on fans/bajadas that flank the basins or are in proximity to paleo-wetlands in small playa basins. A few of the Folsom sites are near paleo-lakes. The lithic assemblages are from kill/butchery sites and base camps. The types and relative abundance of lithic materials from these Folsom sites suggest that the river may mark a significant boundary. There is also variation in lithic material types on a north-south axis on the west side of the river. These western groups employed a variety of raw materials from local or regional resources from the west

while groups on the east relied on Southern Plains sources, although local resources are common in some basins. Limited contact between western and eastern groups is seen in occasional occurrences of western materials on the east side of the river, and vice versa.

Holliday, Vance (University of Arizona)

[219]

Discussant

Holliday, Vance [82] see Kielhofer, Jennifer

Hollingshead, Analise (National Park Service), Tara Skipton (Florida State University), Jayur Mehta (Florida State University), Brian Ostahowski (Louisiana Archaeological Society) and Theodore Marks (New Orleans Center for the Creative Arts)

[18]

We're Far from the Shallow Now: Assessing Climate Change Impacts in the Gulf of Mexico

What would it mean to lose our cultural heritage within the Gulf of Mexico? As greenhouse gas emissions continue to increase and contribute to global warming, the rapid onset of events such as Hurricane Michael in 2018 or slow onset of sea level rise continue to threaten terrestrial and submerged archaeological sites. With 39% of Americans living in counties directly on the shoreline, this is a serious concern; especially considering that the Intergovernmental Panel on Climate Change predicts anywhere from 0.5 m to 1.2 m of sea level rise by 2100. Climate change today threatens a unique archaeological record located along or within the Gulf of Mexico that dates as far back as 20,000 years ago. We present information on archaeological sites located in the Big Bend region of Florida and the Mississippi River Delta, examining how climate change has or will impact both terrestrial and submerged archaeological sites. Through predictive modeling and direct observation, we highlight a few key narratives whose story has or will be significantly impacted by climate change.

Holly, Donald (Eastern Illinois University), Christopher Wolff (University at Albany, SUNY), James Williamson (Memorial University) and Jessica Watson (University at Albany, SUNY)

[12]

Hearth and Home at Sabbath Point: A Beothuk Housepit on Red Indian Lake, Newfoundland

We report on recent excavations at an unusual Beothuk housepit feature located on Red Indian Lake, in the interior of the island of Newfoundland, Canada. The housepit is remarkable for its large size and hexagonal shape, for having escaped destruction from logging, flooding, and earlier avocational investigations, and for the fact that it does not appear to have been embedded within a cluster of other housepits. Furthermore, excellent faunal preservation and material evidence suggesting that the house was occupied toward the end of the eighteenth century presents an extraordinary opportunity to investigate Beothuk lifeways at a critical point in the history of these people. In this paper we discuss our archaeological research at the site and situate these findings within the broader context of what is known of Beothuk domestic architecture, settlement organization, and the late eighteenth-century history of these people.

[12]

Chair

Holmberg, Karen (New York University)

[157]

Prehistoric Eruptions, Contemporary Catastrophes, and Future Risk Perception at Chaiten Volcano, Northwestern Patagonia, Chile
Chaiten volcano erupted unexpectedly in 2008 and prompted the largest evacuation in Chile's history. Once the eruption ended and resettlement began, closer examination of the landscape resulted in two surprises: (1) the volcano has erupted nearly continuously for 18,000 years, and (2) a cave filled with prehistoric shell middens and rock art was used throughout millennia of human occupation. A newly constructed museum will house the archaeological interpretations from our transdisciplinary research team as well as live streaming volcanological data from monitoring stations on the volcano and work created during art therapy sessions done with residents in 2013 and 2019. This commemoration of the past experience of eruptions and current data is important because residents chose to resettle the town directly on the former site, leaving them vulnerable to future volcanic hazards. The municipality is keen to use the geological and archaeological heritage as a draw for the tourism they feel will provide a sustainable economic base. In addition to presenting our recent data, this paper will query what the role of the past is to the present and future in active volcanic contexts.

Holmes, Charles (University of Alaska, Fairbanks), Ben Potter (University of Alaska, Fairbanks) and Joshua Reuther (University of Alaska Museum of the North)

[82]

A New Cultural Sequence Synthesis for the Tanana Valley, Alaska

Archaeological data for the Tanana Valley region are expanding at a rapid pace. There is a need to synthesize nomenclature across archaeology sites in the region that have been investigated from the 1930s to the present. These sites and their archaeological components have been reported by investigators using different naming systems for increasingly complex records. We examine cultural chronologies through radiocarbon data at the assemblage level and evaluate ostensible cultural designations to provide a common terminology across the region. In general, archaeologists have documented components that are fitted into familiar cultural units (e.g., Denali complex, Northern Archaic tradition); however, not all components have assigned affiliation, and we introduce some new designations to complete the regional cultural sequence.

Holmes, Charles [82] see Reuther, Joshua

Holt, Evan (University of Wyoming), Todd Surovell (University of Wyoming), Brian Wygal (Adelphi University), Kathryn Krasinski (Adelphi University) and Charles Holmes (University of Alaska, Fairbanks)
[82]

Site Formation Processes: A Vertical Refit Distribution Analysis from the Holzman South Site, Shaw Creek Flats, Alaska
Archaeologists have long-recognized that postdepositional activities and processes can affect site deposits, and that these processes may introduce substantial biases in the interpretation of sites and assemblages. A frequent assumption is that, barring stratigraphic disturbances, thin, well-defined stratigraphic layers are discrete and meaningful archaeological units, but vertical mixing of archaeological deposits can cause errors in interpretations, particularly with respect to occupation history and the age of archaeological components. Vertical mixing, for example, can cause artifacts to spuriously become associated with sediments and/or artifacts older or younger than themselves. To reconstruct the occupation history of a site, therefore, it is critical to have some understanding of the degree to which sites are vertically intact. Another aspect of this study will pertain to the horizontal distribution of chipped stone refits. Horizontal dispersion of artifacts gives insight toward the use of space at this site. Refitting of chipped stone artifacts is one means of gaining such insights for both vertical and horizontal distributions. In this study I will analyze the vertical and horizontal distribution of refits at the Holzman South site (XBD-422) in the Tanana River Valley of Interior Alaska to contribute to our understanding of these aspects of site formation.

Homan, Michael (Xavier University of Louisiana)
[86]

Discussant

Honeychurch, William
[62]

Discussant

Hong, Hyewon [162] see Akoshima, Kaoru

Hong, Jong Ha [244] see Shin, Dong Hoon

Honorato, Vinicius [161] see Rocha, Bruna

Honeychurch, Lennox [239] see Wallman, Diane

Hooker, William, III [132] see Whitney, Kristina

Hoover, Corey (Pontificia Universidad Católica del Perú) and Kylie Quave (George Washington University)
[242]

Phytolith Plant Remains from Yunkaray, Cusco, Peru

Yunkaray, located in the Maras Plain of Cusco, Peru is the largest LIP settlement attributed to the Ayarmaca cultural group and was occupied from approximately 1050–1450. The proximity of the group to Incan political centers provides for several differing interaction dynamics between the two groups and neighboring entities. This investigation is an extension of previous research on plant remains at Yunkaray, focusing on Phytolith remains. Utilizing macro, micro and phytolith analyses, we discuss a comparison between the archaeological record and ethnographic and chronicled records through the scope of phytolith plant remains. We find several examples of plant remains outside the scope of a simple subjugated polity in the shadow of the Inca empire and discuss the broader network dynamics these findings imply.

Hoover, Hannah (University of Michigan)
[119]

An Analysis of Soapstone “Gaming” Disks from the Berry Site in Western North Carolina

Soapstone is the primary temper source for Burke phase pottery—a regional variant of the Lamar ceramic tradition—produced in the western North Carolina Piedmont at the time of Spanish contact in the mid-sixteenth-century. Soapstone, in both its temper reduced and whole form, has also been documented at several Burke phase sites in the form of ceramic and worked stone “gaming” disks. A high frequency of worked soapstone fragments and soapstone disks were found during excavations of sixteenth-century Fort San Juan and the adjacent Spanish residential compound of Cuenca, a colonial outpost located near to the upper Catawba Valley settlement and likely paramount chiefdom town of Joara. This poster presents a novel analysis of these soapstone gaming disks and fragments by testing different approaches to differentiating stone and metal tooling. Results will serve as a proxy for evaluating Spanish engagement in a colonial cottage industry that may have mimicked local Native American disk forms and uses. This study offers to enhance our understanding of how small-scale economic strategies and gaming were used by both the Spanish and the indigenous people of Joara to navigate the complex social worlds of colonial interaction.

Hoppa, Kristin (Channel Islands National Park), Matthew Vestuto (Barbareno-Ventureno Band of Mission Indians) and Jennifer Perry (California State University Channel Islands)
[160]

Navigating Cultural Landscapes with Ethnographic Place Name Story Maps

This presentation shares an interactive story map that visitors can use to navigate and interpret the cultural landscapes of Channel Islands National Park. The human story of the Channel Islands is unique and fascinating, with over 13,000 years of occupation. One challenge to communicating this story to park visitors is the sensitive nature of archeological sites—in order to best protect our cultural resources, we have to keep their locations confidential. Research into traditional place names allows us to tell the human story as it relates to the island landscapes, seascapes, and natural resources without compromising archeological sites. By working directly with members of the Chumash community, this project allowed descendants to narrate their own history in ways that serve their needs and interests, in particular by making them partners in decision-making about what can and should be communicated in a public forum. Further, the emphasis on human-environment relationships allows visitors to connect the cultural and natural resources of the islands in a particularly meaningful and powerful way for everyone.

Hopper, Courtney [77] see Waters, Albert

Hopwood, Marie (Vancouver Island University)
[86]

Teaching with Beer: An Archaeology of Beer in and outside of the Classroom

Why study an archaeology of beer? Beyond the modern popularity of craft beer, this beverage is a deeply ancient and meaningful form of material culture. It is also a powerful tool to put faces onto the past, and to make the ancient peoples we study both relevant and enticing to our students and the larger public. Through my Raise Your Glass to the Past experimental archaeology project community members from central Vancouver Island, BC, experience ancient-inspired ales combined with information about the associated cultures in a way not experienced by these audiences before. Aside from drinking the beer, the Raise Your Glass to the Past project shares archaeological knowledge through interpretations of taste, daily practices and ways of knowing. It has long been shown that the cultural construction of taste is embedded with meaning and references both identity and place. Evidence of the daily practices of ancient life can highlight ways of production, gender roles and habitus. Lastly, the ways of knowing about the science of fermentation, as well as relationships structured around drinking, allows for a unique viewpoint into the lives of past peoples, putting faces onto the past and making their humanity more real to non-academic audiences.

[86]

Chair

Horan, Robert [231] see Napora, Katharine

Horn, Marty (Louisiana Geological Survey), Britt Bousman (Texas State University), Jennifer Whittington (Consulting Geologist, Golden, CO), Sarah Morris (Texas State University) and Molly Hall (AR Consultants, Richardson, TX)
[170]

Looking for Pre-Clovis Geological Deposits in the Sulphur River Valley, Texas

The presence of Pre-Clovis archaeological evidence is limited in the southern U.S. due to Late Pleistocene geological erosion. Few regional alluvial sequences contain deposits that are old enough to preserve in situ evidence of Paleoindian human occupations and even fewer are likely to have evidence of Pre-Clovis occupations. Michael Collins inferred over 30 years ago that the Sulphur River valley offers great potential for Paleoindian occupation in the woodlands of East Texas. Field research in the Sulphur River drainage by Collins and Britt Bousman in the 1980s and later by Bousman and Alan Skinner in early 2000s identified preserved fluvial deposits dating to Late Pleistocene and Early Holocene. Recent field study in the North Sulphur flood basin expands this work by integrating electrical resistivity tomography and geological coring on a basin scale. To date, over 6.5 km of resistivity transects have been measured in the North Sulphur River basin, imaging lithostratigraphic topology among Late Pleistocene and Early Holocene fluvial deposits cradled in Cretaceous bedrock. The resultant remote sensing models, constrained by sediment cores and channel wall profiles, are interpreted in context of Late Pleistocene–Early Holocene paleogeography, permitting assessment of potential pre-Clovis occupation in the northeast Texas region.

Horn, Sherman (Grand Valley State University), Anabel Ford (University of California, Santa Barbara) and Paulino Morales (University of San Carlos, Guatemala)
[7]

Terraces, Quarries, and Berms, Oh My! Evaluating Land Use and Landscape Modification at the Ancient Maya City El Pilar

Ongoing research at El Pilar—an ancient Maya city located along the Belize/Guatemala frontier—has documented hundreds of landscape-modification features in the area surrounding the monumental civic center. The complexity and variety of these features, which include terraces, berms, quarries, check-dams, and aguadas, indicate the sophistication of Maya environmental manipulation and reveal potential aspects of socioeconomic organization within the city. Our full-coverage survey at El Pilar, guided by high-resolution Lidar imagery of the area surrounding the city center, permits a broad-based inquiry into human-environment interactions in the tropical Maya Forest. This poster presents updated survey results from the 2019 field season and preliminary spatial analyses of cultural remains. We explore the distribution of landscape modification features and examine relationships between these features, settlement patterns, and topography to investigate land-use strategies around a major Classic Maya center.

Horn, Sherman (Grand Valley State University)

[155]

Discussant

Horning, Audrey (College of William and Mary)

[112]

Efficacious Objects? Architecture and Dwelling in the Ulster Plantation

The Ulster Plantation, launched in 1609 as a colonial effort to supplant the Irish with British planters, intended architecture as a "civilizing" tool. Plans required the construction of dwellings "after the English manner": meaning timber framing, glazed windows, and chimneys in contrast to Irish forms such as turf walled buildings with open hearths, or fortified tower houses. Yet archaeological evidence suggests that planters adapted existing structures, while buildings that outwardly comply with regulations still employed Irish construction techniques. Some planters appear to have intentionally engaged in mimicry of elite Gaelic practices through appropriation of tower houses, while use of vernacular Irish buildings within plantation villages may have served as a means of cultural mediation. Buildings within the urban setting of Londonderry followed plantation precepts, yet archaeological finds from the town ditch indicate material hybridization. The extent to which the built environment was central to the transformation of identities in early modern Ireland emerges as a key interpretative theme with relevance to other colonial settings.

Horowitz, Rachel (Appalachian State University)

[54]

Chair

Horowitz, Rachel (Appalachian State University) and M. Kathryn Brown (University of Texas, San Antonio)

[158]

Preclassic Ritual at the Las Ruinas de Arenal, Belize E Group

Early public architecture in the Maya lowlands, including E Groups, are marked by the presence of ritual activities associated with foundational offerings and ritual displays. Recent investigations at Las Ruinas de Arenal, Belize revealed a series of ritual deposits that may represent the initial founding of a Middle Preclassic E Group complex. Investigations of burials, caches, and other deposits in the E Group plaza illustrate the development and continuity of ritual activities at the site and the importance of creating sacred place and centering. This paper will explore ritual activity at Arenal, focusing on evidence of ancestor veneration, while situating these activities within the broader regional context during the Preclassic period.

Horowitz, Rachel [54] see Cap, Bernadette

Horowitz, Rachel [20] see Paling, Jason

Horrell, Christopher (Meadows Center for Water and the Environment at Texas State University), Roberto Junco (INAH), Melanie Damour (Independent Researcher) and Frederick Hanselmann (Rosenstiel School of Marine and Atmospheric Science)

[18]

Conquest: The Lost Ships of Cortés Project and the Search for a 500-Year-Old Scuttled Fleet in the Gulf of Mexico

The discovery and exploration of Mexico during Spanish expeditions in 1517 and 1518 set the stage for the conquest of the Aztec capital Tenochtitlán in 1521. Appointed by the Governor of Cuba in 1519, Hernán Cortés led another expedition to explore and establish trade in these newly discovered lands. While Cortés forged alliances with indigenous communities, a faction of his men mutinied. As a result of the mutiny and the poor condition of the vessels, Cortés ordered 10 of his 11 ships sunk in an effort to quell the mutiny and motivate his men. In addition, Cortés made the decision to break from the Cuban Governor by establishing the town of Villa Rica de la Vera Cruz. With the 10 ships scuttled, Cortés ordered the eleventh vessel, Cortés' flagship, sent to Spain with news of his discoveries and intentions. Shortly afterward, Cortés began the march inland and began his conquest of Mexico. In 2018 and 2019, the Lost Ships of Cortés Project conducted geophysical surveys and diver investigations to identify the 500-year-old remains of these scuttled vessels. This paper discusses the results of the first two field seasons.

Horta, Luis [67] see Belardi, Juan

Houghten, Holly (THPO Mescalero Apache Tribe)

[113]

Discussant

Houk, Brett A. (Texas Tech University)

[155]

Discussant

Houk, Brett A. [53] see Novotny, Claire

Houle, Jean-Luc (Western Kentucky University), Oula Seitsonen (University of Helsinki), Natalia Égüez (University of La Laguna), Lee Broderick (University of York) and Jamsranjav Bayarsaikhan (National Museum of Mongolia)
[62]

A Window to the Past: Tracing the Development of Mobile Pastoralism in Northwestern Mongolia

Currently, the development of mobile pastoralism and the chronology and nature of early pastoralist societies in Mongolia is known almost exclusively from burial and ritual contexts. Here we present the results of archaeological excavations and geoarchaeological work carried out at a deeply stratified habitation site in the Zuunkhangai region of NW Mongolia. Our data include material culture, faunal remains, environmental data, and chronology that document the development of mobile pastoralism in this region. The preliminary results of the ongoing Western Mongolia Archaeology Project are starting to provide new details about the chronology, nature, and environmental context of early pastoralism and the long-term patterns of settlement geography and site use in NW Mongolia. Among other things, our findings index the local durability of pastoralist occupation over 4000 years, as well as the adaptive resilience of the herders here, indeed up to the present day, and this despite major changes in the sociopolitical, socioeconomic, and environmental conditions through time.

Houle, Jean-Luc [62] see Égüez, Natalia

Housse, Romuald [174] see Chamussy, Vincent

Houston, Gordon

[211]

The Houston Solar Marker Matrix

Rock art is ubiquitous around the world. Solar markers are the placement of rock art motifs placed to interact with sunlight and shadows on culturally significant days. The astronomical interpretation is the most objective interpretation of rock art. In the American Southwest the numbers of reported solar markers is more than statistically significant, hence the intentionality of the placement. Yet, worldwide, there is a paucity of reported solar markers. This is in part, due to the lack of knowledge on the part of researchers. The Solar Marker Matrix of Intentionality was introduced at the 2014 SSA Annual meeting. Through continued observations, discussions, and impute the Houston Solar Marker Matrix (HSMM) has been updated and revised. The purpose of the HSMM is to confirm reported solar markers, and or to be used to identify new solar markers. Finally, to help educate researchers worldwide in the astronomical analysis of solar markers, leading to additional reports, from which a data base can be created for statistical analysis.

Houston, Stephen (Brown University) and Karl Taube (University of California, Riverside)

[164]

Houses of Mirth: The Ancient Maya and the Laughter of States

Kings are laughter-averse: to invite humor is to encourage disruption, an agelastic (non-jovial) orientation that tends to pomp but not to self-directed mirth. The Classic Maya invited laughter in political settings through ritual clowning, sponsored by kings and placed within detectable spaces and buildings. Often understood through folklore or in villages, mirth had a role in Maya cities and among the dynasties that governed them. The foreign and the fat, the awkward and ugly, fell squarely into what was funny, but as slotted away from local, elegant, and pleasing kings.

Hovezak, Tim (National Park Service), Gary Ethridge (National Park Service), Kay Barnett (National Park Service) and Donna Glowacki (University of Notre Dame)

[149]

Far View House: Evolution of a Chaco-Era Great House, Past and Present

The Far View Great House in Mesa Verde National Park is the center of a densely populated pueblo village currently under study by the Far View Archaeological Project (FVAP), a five-year collaboration between the National Park Service and the University of Notre Dame. Now maintained by the Park Service as an exhibit for public education, the site has weathered the elements for a full century since its excavation in 1916 by Dr. J.W. Fewkes. The history of preservation treatments at Far View House is replete with examples of structural weakness and failure, with the prevailing treatment strategy continually focusing on stabilization and reconstruction with commercial materials which, in combination with natural weathering of the fabric, has significantly changed the character of the site. We explore the archaeological significance, history, and management of this iconic site, beginning with Fewkes' early investigations, continuing through the work of other notable professionals such as Earl Morris, J. A. Lancaster, and Stanley Morse, to a recent NPS architectural documentation and stabilization effort which has resulted in new findings on how the site evolved during its occupation.

Hovezak, Tim [149] see Field, Sean

Howard, Alex (Logan Simpson)

[214]

The Historic Context of Eagle Creek through the Lens of Field and Archival Data

The Eagle Creek area of the Apache-Sitgreaves National Forests has a rich history, both prehistoric and historic. Logan Simpson recently conducted a pedestrian survey on behalf of the ASNF along a portion of Upper Eagle Creek, recording several historic-age archaeological remains reflecting the varied land-use of the region, including ranching, homesteading, and Forest Service management. This poster discusses the historic context of the Eagle Creek region, with archival research augmenting our survey data within this eastern Arizona community.

Howe, David, Chris Rowe (New South Associates Inc.) and Kelly Brown (New South Associates Inc.)**[187]***Applied Anthropology at the Veterans Curation Program*

The Veterans Curation Program (VCP) is a U.S. Army Corps of Engineers (USACE) program designed to assist veterans in their transition from military service to civilian life while simultaneously rehabilitating at-risk USACE archaeological collections. The majority of VCP laboratory managers have a graduate degree (or comparable experience) in anthropology so that a basic theoretical approach to the science of anthropology is understood by the management staff of each lab. While archaeology is the main subfield of anthropology practiced at the VCP, managers continually utilize their backgrounds in the other subfields of anthropology, particularly cultural anthropology. This poster showcases several examples of how applied anthropology helps managers better assess the needs of their technicians and how it makes the VCP experience more effective for veterans in an often uncertain transitional period.

Howe, Ellen [258] see DeLeonardis, Lisa

Howe, Mark (U.S. State Department, USIBWC) and Nancy Gonzalez (Independent Academic)**[101]***W. T. Millington and the Mexican Revolution: The Search for Battle Sites and Camps*

The Millington letters from 1910 to 1913 described military actions along the Rio Grande in Presidio, Texas at the start of the Mexican Revolution (1910–1920). These letters are handwritten accounts of the Mexican Revolution and what was occurring across the U.S.–Mexico international border and how this unfolded in the Big Bend region. This presentation will examine what happened in this area and the battles across the river in Mexico between the “insurrectos” and Mexican Soldiers. We will review what has been found archeologically on the United States side and explorations in Mexico. In all, by examining new information along the border and how the International Boundary Commission (IBC) under Consulting Engineer W. W. Follett was involved, we can understand a little more of this time in history. Examination of Follett’s activities and Millington’s letters show how both played large but unknown roles in history, especially in the Big Bend Region.

[101]*Chair***Howell, Mark (Winterville Mounds-Mississippi Department of Archives and History)****[266]***Sound as a Ritual Offering: The Underlying Meanings of Mississippian Effigy-Rattling Bowls*

Soundmaking artifacts are rare at Amerindian mound-plaza sites of the Mississippian Period (1050–1550 AD). Curious exceptions are small ceramic container rattles in anthro- or zoomorphic shapes such as those that have been found in relative abundance at the Lake George site in the Yazoo-Mississippi Delta. Five Lake George rattles that were originally affixed to the rims of pottery vessels, here sometimes called adorn rattles, are part of the Butler Collection donated to the Mississippi Department of Archives and History. This paper focuses on the sonic and iconographic elements of these rattles, including reasons for the intentional combination of their sensory-related elements, and the circumstance(s) of their being found separated from vessel rims. The research draws on contemporary visual and audio technologies, combined with experimental archaeology in interpretation. The multimedia aspect of the Lake George adorn rattles makes their decipherment particularly important for understanding the role of sound and its relationship to iconography, and perhaps ritual in Mississippian culture.

Howey, Meghan (University of New Hampshire) and Dylan Kelly (University of New Hampshire)**[33]***High Risks for High Rewards: Modeling Early Seventeenth-Century Aquatic Transport Suitability in the Great Bay Estuary, New England*

During the early 1600s, the Great Bay Estuary was a frontier colonial settlement that rapidly became an economic hub for the extraction and export of natural resources into the West Indies trade network. Transport of goods using specialized boats in this tidal riverine system was critical to the region’s key role in helping fuel the success of the British Colonial Empire in Northeastern North America. The shallow, strong tidal rivers of Great Bay Estuary offered a high risk/high reward scenario for aquatic transport. If knowledge of tides was executed perfectly, the energy power of tides meant specialized boats could carry heavy goods at almost no cost. With any miscalculation, boats would be stranded and/or destroyed. We develop a model of aquatic transport suitability for this estuary to understand why and when investment in this risky transport system became a productive decision. We develop a first iteration of the model as if we were working in an ancient period, without historic documents, and compare our findings with historic records to refine and improve subsequent model iterations. We aim for this case, which has rich archival sources, to help inform models of aquatic transport in expansive empires without similar detailed records.

Howey, Meghan [184] see Friese, Crystina

Howland, Matthew [147] see Liss, Brady

Hoyos Velasco, Fabiola [121] see Medina Hernández, Abril Ameyalli

Hranicky, William**[198]***A Reexamination of the Thunderbird Paleo-Site in Virginia*

The Paleoindian Thunderbird site in Virginia was excavated in the 1970s by William Gardner of Catholic University. There have been suggestions of problems with stratigraphic work at the site and its interpretation. This paper identifies several methodological mistakes that have been previously published. The paper argues that there is a pre-Clovis occupation at the site associated with blade-made artifacts that can be correlated with the Upper Paleolithic of Europe. Similar examples are illustrated with artifacts found elsewhere in the Middle Atlantic region at sites dated to the pre-Clovis period, such as the Meadowcroft Rockshelter site in Pennsylvania. This paper also discusses the Thunderbird site's protection by the Archaeology Conservatory.

Hronec, Laura**[88]***Discussant***Hrynck, Gabriel (University of New Brunswick)****[12]***Building the Dawnland: Toward an Architectural History of Hunter-Gatherers on the Maritime Peninsula*

Architectural history relies on the idea that the human-built environment reflects and reinforces cultural ideas about how people view the world. Architecture therefore permits cultural changes to be tracked through time. Despite this, a literature review of past considerations of hunter-gatherer-built environments reveals remarkably little interest in approaching them through a lens of architectural history. Rather, a few contrary themes emerge: that hunter-gatherer architecture is so ephemeral that the traces it leaves on the landscape elude study; and, that hunter-gatherers don't really produce houses at all—they make shelters, the shapes of which are more or less dictated by environmental realities. In this paper, I begin to consider an architectural history on the Maritime Peninsula: how Wabanaki people built their homelands as an historical process, contextualizing historic accounts of Wabanaki wigwams as forms of persistence and resistance against colonialism and a way to maintain mobility and identity.

[12]*Chair*

Hsiao, Wei-Lin [175] see Payntar, Nicole

Hu, Lorraine (Washington University, Saint Louis)**[216]***Earth, Water, and Fire: Reexamining Cremation Practice in the Pastoral Neolithic of Kenya*

The spread of pastoralism in East Africa ca. 5000–1000 BP was facilitated by peoples with diverse technological suites, subsistence strategies, and cultural practices. Recent aDNA work has revealed the genetic similarity of individuals associated with two material culture traditions in southern Kenya, the Savannah Pastoral Neolithic and Elmenteitan. While scholars have elucidated the economic aspects of these two traditions, the expression of social groups on the cultural landscape is as of yet unclear. The study of cremation, a particularly intense mortuary practice from this time period, is one avenue by which community practice may be investigated but has received little scholarly attention. This presentation will focus on pilot data from a reanalysis of previously excavated cremation sites including the Njoro River caves, Lion Hill Cave, Keringet Cave, and Porcupine Cave. Initial research suggests that cremation practices were more diverse than previously assumed, with funerary components including secondary reburial of cremated individuals as well as corpse defleshing prior to cremation. Both inter- and intrasite variation in practice demonstrate that a straightforward attribution of cremation to the Elmenteitan tradition, as previously assumed, may be obscuring the full diversity of Pastoral Neolithic mortuary practices and the communities taking care of their dead.

Hu, Qitian [26] see Smith, Michael

Hu, Xiaonong [199] see Zhao, Chao

Hua, Quan [28] see Hendrickson, Mitch

Hua, Quan [100] see Weisler, Marshall

Huaman, Oscar [86] see Jennings, Justin

Huang, Cindy Hsin-yee (Arizona State University)**[36]***An ABM for the IUP in NEA? An Agent-Based Model for the Spread of the Initial Upper Paleolithic in Northeast Asia*

Discussions of human dispersal out of Africa traditionally use the Initial Upper Paleolithic as markers of the arrival of anatomically modern humans. From this perspective, there was a single migration event that eventually allowed humans to move out of Africa, across Eurasia, and eventually into the Americas. However, new research has suggested that these migrations are far more complex than previously hypothesized, involving multiple migrations, varying routes, and some interbreeding with archaic Homo populations. In particular, as the Upper Paleolithic spread into Asia, the relationship between what is known as the Initial Upper

Paleolithic and anatomically modern humans is unclear. In this paper, I use an agent-based model to examine the spread of the Initial Upper Paleolithic in Northeast Asia and to test whether it was the result of the arrival of the first anatomically modern humans in the region, or if the Initial Upper Paleolithic could have been a set of cultural traditions that spread through existing populations. Northern Asia is a locale of particular importance in discussions of peopling the New World, and thus a better understanding of human movement in this region could clarify our knowledge of large-scale migrations.

Huang, Cindy Hsin-yee (Arizona State University)

[95]

Discussant

Huang, Lushuang [244] see Rayfield, Kristen

Huashuayo Chávez, Willy [268] see Zborover, Danny

Huckell, Bruce [68] see Holliday, Vance

Huckert, Chantal (Universidad Veracruzana)

[2]

The Grid Patterns in the Vestments and Headdresses of Female Statuary from the Classic Period Cultures of Central Veracruz
Various researches report that the diamond, rhomboid, and square-gridded patterns and their stepped variants designate the surface of the earth as the fecund female progenitor, manifested in flowers, corn cobs, and sweet nurturing waters. These patterns also designate the zoomorphic aspects of the shell or skin of the fertile earth. In the Maya codices, the mother goddesses weave gridded-patterned fabrics on their autochthonous looms, creating a primordial texture of the warp and weft crossing of the threads. From these perspectives, we shall explore the meanings of the gridded patterns in the headdresses and vestments of female statuary from Late Classic Central Veracruz archaeological sources. As we identify the various gridded patterns with the depicted objects, for instance the body of a mazorca de maíz and its kernels, and the pictogram that consists in a pars pro toto of this same corn cob, we shall show that these patterns are intended to be signs in a graphic system implemented in textiles, which correspond to Mesoamerican forms and conventions. The body languages of the statues, their hairdos, headdresses, and vestments, will comprise datasets that will allow us to highlight the ceremonial functions associated with the female gender in Classic Veracruz.

Huckleberry, Gary (Geoarchaeological Consultant)

[140]

Past Landscape Changes and Human Occupation of the Northern Sonoran Coast near Puerto Peñasco, Mexico

Recent geoarchaeological research of shell midden sites along the arid to hyperarid northern Sonoran coast near Puerto Peñasco confirm ~6,000 years of human exploitation of lagoons, estuaries, and tidal flats for procurement of fish and shellfish. Evidence suggests that different groups briefly visited the far northern Gulf of California during the cooler seasons of the year at strategic points where there was potable water. Coastal geomorphic processes including the creation of sand barriers that help protect wetlands and fish-shellfish nurseries play an important role in creating and maintaining these productive habitats. There appears to be no significant change in nearshore ecology or in the intensity of human coastal habitation from the Middle Archaic to Protohistoric periods despite local neotectonism at Bahia Adair and Rio Sonoyta channel shifting. However, it is unclear to what degree these productive nearshore environments were present during the period of post-glacial rapid sea level rise during the Pleistocene-Holocene transition. Two scenarios are presented that have different consequences with respect to earlier (Paleoindian and Early Archaic) human occupation of the coast and the resilience of current coastal habitats to forecasted rapid sea level rise.

Huebert, Jennifer [262] see Filimoejala, Darby

Huey, Samuel [9] see Britt, Tad

Huff, Meagan [172] see Wilson, Douglas

Huffman, Thomas (University of the Witwatersrand)

[234]

Archaeological Research in the Mapungubwe Cultural Landscape

Archaeological investigations in the Limpopo Valley began in 1999 as part of the University of the Witwatersrand's 'Origin of Mapungubwe Project. Initially, the focus was on the role of agriculture in the development of Mapungubwe—southern Africa's first state. Over the years, various student teams recorded some 1150 Iron Age (AD 400–1800) settlements inside the World Heritage site and Buffer Zone. The sites range from agricultural-orientated homesteads, to agricultural field camps, cattle posts and ritual places. In addition to cultural themes, these sites have contributed to three inter-related research projects that involve natural scientists: droughts, baobabs and paleomagnetism. First, burnt granaries in agricultural homesteads and field camps were the result of ritual acts by people suspected of causing severe droughts. Secondly, isotopic data from growth rings in living baobab trees help to date the droughts. And thirdly, burnt granaries fixed magnetic signals that show dramatic changes in Earth's magnetic field,

challenging the retrodicted model for past stability.

Huffman, Thomas [60] see Earley, Frank

Huggins, Kathleen (University of California, Berkeley) and Matthew Sitek (University of California, San Diego)

[243]

Typology and Intrasite Distribution of Tiwanaku (ca. AD 500–1100) Ground Stone Tools at Cerro San Antonio (L1) in the Middle Locumba Valley, Peru

We present a typology and intrasite density analysis of ground-stone implements at the multicomponent site of Cerro San Antonio (L1) in the middle Locumba Valley in southern Peru. The contexts examined for this study were marked by dense domestic refuse and associated domestic architecture, with most material correlates suggesting an affiliation to the Tiwanaku culture during the Middle Horizon Period (ca. AD 500–1100). Ground-stone tools and implements were essential to household food preparation and craft production tasks, and can be found in most prehistoric domestic assemblages. Ground-stone tools are also commonly identified between and outside of households, with intrasite household distributions of specific tool types suggesting lending between households as well as outdoor domestic activity areas. However, due to their bulky nature and heavy weights, ground-stone artifacts are often simply counted and generally identified in field, and only collected for further analysis from excavation. This study combines data from targeted systematic survey and extensive excavations conducted at two large domestic sectors in 2019, with a "catch and release" in-field analysis and GPS tagging strategy. With these descriptions and technical illustrations, we hope to provide the basis for more systematic studies of ground-stone tools from Tiwanaku and Middle Horizon domestic sites.

Hughes, Karissa (Laboratories of Molecular Anthropology and Microbiome Research), Nawa Sugiyama (University of California, Riverside), Nihan Dagtas (Laboratories of Molecular Anthropology and Microbi) and Courtney Hofman (Laboratories of Molecular Anthropology and Microbi)

[244]

Using Ancient Mitogenomics to Investigate Canid Procurement in the Teotihuacán Ritual Landscape

Dogs have captured mankind's attention for thousands of years, often overshadowing human interaction with other canids. In ritual contexts at Teotihuacán, four different canids have been identified in the faunal assemblages: the Mexican grey wolf (*Canis lupus*), the coyote (*Canis latrans*), the domestic dog (*Canis lupus familiaris*) and possibly a wolf-dog hybrid (*Canis lupus-familiaris*). As one of two domesticated species in Mesoamerica (alongside the turkey), dogs were prominent participants in domestic rites but seemingly absent as key actors in state ritual spectacles. Wild and domestic canids were symbolically and functionally distinct, and the Teotihuacán state selected the wolf as a primary state symbol. To explore the relationship between canids and people in ancient Mesoamerica, we sequenced mitochondrial genomes from six canid samples from three areas inside the city: the Moon Pyramid (ritual complex), the Sun Pyramid (ritual complex) and the Plaza de las Columnas (civic-administrative complex). We also investigate the relationships between individual canid samples by comparing mitogenomes within and between the two different contexts. This project contributes intriguing information about Teotihuacán, its people and ritual as well as informing broader questions regarding human interactions with endemic canids in the Americas prior to European arrival.

Hughes, Karissa [244] see Singleton, Robin

Hulen, Cyrus (College of Wooster) and Olivia Navarro-Farr (College of Wooster)

[5]

Meeting the Neighbors: An Analysis of Inter-Archipelagic Interaction in the Cook Islands

The Cook Islands are situated east of Samoa in Polynesia. In this poster, we examine the trade relationship between the Cook Islands and the surrounding Samoan, Tongan, and Society Islands as a proxy for general interaction. Preliminary research, based on x-ray fluorescence analysis of stone tools and debitage and petrographic analysis of the few sherds derived from archaeological contexts in the Cook Islands, suggests a preference for trade with islands groups in Western Polynesia, notably Samoa and Tonga. Additional evidence for interaction comes from the analysis of fishhook morphology and relevant anthropological literature. The prevailing question is why this preference exists despite mutual accessibility models predicting more contact with the Society and Austral Islands than West Polynesia. This poster will include review of climatological, economic, and socio-political explanations, all of which likely contribute to a more nuanced understanding of this complex pattern.

Humphreys, Stephen (Durham University), William Griswold (Northeast Region Archaeology Program) and Steve Roskams (University of York)

[188]

Rehabilitation Archaeology in the Context of the DPAA Mission

Since 2016 American Veterans Archaeological Recovery (AVAR) has placed American military veterans onto mission-oriented, team-centered archaeological excavations to build peer-support communities and enhance mental health. In September of 2019 AVAR partnered with the Defense POW/MIA Accounting Agency in its mission to recover the remains of aircrew lost in a B-24 Liberator crash in southern England in 1944. The project benefited from a combination of British and American technical expertise and support; archaeologists from the National Park Service and the University of York Department of Archaeology oversaw technical aspects of excavation. The University of York and Breaking Ground Heritage, a British veterans archaeological program dedicated to using archaeology as a recovery pathway, provided participants to the program and facilitated logistics. This poster will illustrate the methodology employed in surveying and excavating the site. Additionally, it will provide results of the wellness surveys utilized during the project in order to demonstrate the positive impact archaeological excavation can have upon veteran participants when appropriate support methods are put into place.

Hundman, Brittany [21] see Espino Human, Richard

Hünemeier, Tábita [244] see Ferraz da Silva, Tiago

Hunt, David

[195]

Using Landscape Learning to Explore Diachronic Change within the Western Stemmed Tradition

The Western Stemmed Tradition (WST) spanned as much as 5,000 years in the Great Basin. However, due to deflationary erosion, more refined control within this wide temporal range remains elusive. Thus, temporally sequencing WST sites, subtypes, and their diagnostic artifacts is currently difficult, often unattainable, and leaves Great Basin archaeologists with few traditional methods for constructing a WST point chronology. Without a means to date many WST sites, some of the most important questions about the human colonization of, and adaptation to, a vast expanse of the arid west have gone unanswered. To help address these problems, my research explores a new method for the chronological ordering of WST sites and for establishing a WST stemmed point chronology. This research employs models of landscape learning, which consider how human colonizers of a new land collectively acquire and share knowledge about their new environment, specifically regarding toolstone acquisition and usage, and creates new methodologies for quantifying the prominence, or discoverability, of lithic resources on the landscape. This approach should allow the detection of a continuum of landscape learning over time, a continuum that should allow WST sites to be ordered in time.

Hunt, Terry [24] see DiNapoli, Robert

Hunt, Turner

[113]

Discussant

Hunter, Andrea (Osage Nation)

[49]

A View from the Osage Nation

The concept and the procedures provided by federal law for the assessment and potential return of Native Americans' ancestors and objects which are sacred, funerary, or deemed cultural patrimony are not conflicting or difficult. It is absolutely amazing how many, and I mean Many, institutions and museums have chosen to address this "issue." In dealing with NAGPRA and also the NMAI Act since 1989, I have had the privilege to work with both laws from the tribal side, the university side, the museum side, and back to the tribal side. This presentation will provide insight on what the Osage Nation has been subjected to from federal agencies, universities, and museums. The Osage Nation's protocol for taking control of the procedures will also be shared.

Hunter, Andrea (Osage Nation)

[96]

Discussant

Huntington, Yumi (Framingham State University)

[141]

Mapping Motifs and Techniques: Tracing the Development and Transmission of Cupisnique-Style Engraved Head Images

Most scholars have identified the ceramics of the Casma, Zaña, and Jequetepeque valleys as being in the Cupisnique style based on shared characteristics of black or brown color and stirrup-spouted shape. Many of these ceramics also exhibit thinly engraved head motifs in numerous variant iconographies, which I have identified in previous writing as being emblems of a unified cultural identity in the region, both borrowing from and contrasting with the imagery of other neighboring cultures. At the same time, the development of the technique of post-firing engraving that was used to create these motifs has not been mapped either historically or geographically based on the archaeological record. While it is widely recognized that these unique objects first appeared in the Formative period (ca. 1200–200 BCE), much more remains to be known about precisely where and when their innovative imagery first arose and how post-firing decorative practices spread through the region over time, for example also appearing in the Formative period ceramics of Paracas. More than just identifying a singular Cupisnique style, then, a visual map of the archaeological record allows us to trace local developments and transmissions even within a region previously defined only through a singular cultural/stylistic identity.

Huntley, Deborah [156] see Baxter, Erin

Huntley, Deborah [203] see Schaefer, Jonathan

Hurst, Heather (Skidmore College), Boris Beltrán (Proyecto Regional Arqueológico San Bartolo-Xultun), Franco Rossi (Boston University), David Stuart (University of Texas, Austin) and Karl Taube (University of California, Riverside)

[138]

Placemaking at the Los Arboles Complex of Xultun, Guatemala

In 2010, archaeologists of the San Bartolo-Xultun Project began investigations of an acropolis complex located at the northern limit of the urban center of Xultun, designated "Los Arboles." The penultimate phase of the complex included extensive preserved plaster

friezes adorning building facades and platforms. Since then, systematic excavations have studied the multiple phases of Los Arboles' construction sequence and documented the incredibly complex iconographic program marking the acropolis as a sacred location associated with ancestral deities and dynastic history. This paper presents the distinct architectural facades of the penultimate phase of Los Arboles as a unified artistic program that includes iconographies of world trees, rain, maize, fire and sacrifice, and reflects on Maya placemaking through the archaeological context of this urban boundary and its imagery.

Hurst, Heather [57] see Rossi, Franco

Hurst, Stance (Museum of Texas Tech University) and Eileen Johnson (Museum of Texas Tech University)

[103]

Decoding Knudson's Flintknappers: A 3D Model Analysis of the Plainview Bison Kill Projectile Points

Excavated in the mid-1940s, the Plainview site on the Southern High Plains generated considerable interest and continues to do so today. After many hours spent illustrating each flake scar of the Plainview (41HA1) bison kill site's lithic assemblage, Knudson stated in her 1973 dissertation that "perhaps only one and at the most two individuals made these tools." To further examine this observation as a hypothesis, 3D models were made using photogrammetry of the Plainview-type projectile points. Twenty of the 28 Plainview projectile points Knudson examined were available for this research. The other eight had been from local collectors. Analysis of the 3D projectile point models focused on flake scar size, orientation, and overall patterning. These data were then compared with 3D models made of Plainview projectile points from the Warnica-Wilson Plainview campsite located near Portales, New Mexico. Greater variation might be expected in a camp assemblage vs. a kill assemblage. Results suggested that 3D models have the potential to quantify the number of flintknappers responsible for projectile point manufacture. A focus on individual variation within Plainview lithic assemblages also appeared to have the potential to delineate the Plainview projectile point type better—a notorious problem for Paleoindian scholars.

Hurt, John Duncan (University of Texas at Austin)

[108]

Social and Behavioral Implications of Architecture at the Cividade de Bagunte

The Cividade de Bagunte is an Iron Age and Roman Period hillfort, or castro, located in the municipality of Vila do Conde in northwestern Portugal. This paper looks at specific features of Bagunte's architectural remains in order to speculate about past social behaviors. Novel approaches to the spatial and material properties of the site's remains may allow us to understand aspects of the ancient community's construction of, perception of, and interaction with their own built environment. Toward this end, the architecture of Bagunte is interpreted as a reflection of past ways of seeing and being, and as a material dimension of fundamental significance to the daily experiences of the site's ancient inhabitants.

Hussey, R. Scott (University of Florida)

[212]

Dungeons and Digital Heritage Advocacy: Preserving Tetouan's Mazmorras through a Virtual Online Museum

Advocating for the heritage management of threatened archaeological sites brings many challenges related to the deterioration, conservation, and accessibility of the sites. In Morocco, Tetouan's Mazmorras, a subterranean prison where Christian captives and slaves were kept from the sixteenth to eighteenth century, are structurally unsound and, thus, sealed from public access. However, this site is one of the only surviving evidences of the networks of capture, trade, and ransom of faith captives in the Early Modern Mediterranean. I have created an online multilingual virtual museum that digitally preserves and increases access to the site while reducing impact on its fragile structure. This museum offers a virtual reconstruction of the underground space through which visitors can navigate virtually. 3D reconstructions of artifacts found during the excavations are also displayed through photogrammetric methods. Finally, I present findings of my archaeological and historical research in multiple languages, which are further contextualized by excerpts of narratives of people held within the dungeons. Overall, this multilingual online museum helps to convey the historical importance of the site to international audiences while protecting it from further damage.

Huster, Angela (Arizona State University)

[133]

Ceramic Chronology in the Absence of a Horizon

In this paper, I present an initial ceramic seriation for the Epiclassic site of Chicoloapan Viejo, in the southern Basin of Mexico, with a discussion of issues particular to periods of political fragmentation. I demonstrate that two phases can be distinguished at Chicoloapan Viejo, based on relative type frequencies, rather than the presence or absence of diagnostic markers. As one of only a handful of Epiclassic chronologies based on well-excavated data and anchored by radiocarbon dates, this seriation has the potential to clarify the dynamics of regional interaction during Teotihuacan's collapse and aftermath. One of the primary challenges in studying periods of political fragmentation can be the establishment of basic chronological periods in cases where political fragmentation has resulted in high levels of regional diversity, resulting in either a lack of diagnostic marker types, or high levels of variation the frequencies and dates of use of a type within a relatively limited area. However, if overcome with detailed, site-level chronologies, such periods of fragmentation offer unique opportunities to examine the very social processes that produced them.

Huster, Angela [26] see Smith, Michael

Hutson, Scott (University of Kentucky)

[102]

Preclassic Pop and Classic Community: Demographic Archaeology in Northwest Yucatán

Research in Northwest Yucatán, Mexico, has played a large role in the development of demographic archaeology in the Maya area, beginning with Edward Thompson's nineteenth-century investigations of housemounds at Labna and reaching a mid-twentieth-century pinnacle with maps of Mayapán and Dzibilchaltun. In the twenty-first century, advances have continued in Classic and Postclassic period demography in both the Puuc and the Plains, along with surprising revelations about the Preclassic. This paper focuses on mapping and excavation conducted by the author in Preclassic contexts in the Ucí area and Classic contexts at Chunchucmil. The paper also reviews new data from Puuc sites such as Kabah, Xocnaceh, Muluchtzekel, Paso de Macho and Yaxhom and from Northern Plains sites such as Poxilá, Xtobo, Izamal, Mayapán, and Aké.

Hutson, Scott (University of Kentucky)

[155]

Discussant

Hutson, Scott [54] see Kidder, Barry

Hutson, Scott [128] see Plank, Shannon

Hyde, David (Western Colorado University) and Fred Valdez Jr. (University of Texas, Austin)

[253]

Shedding Light on the Pre-Maya to Maya Transition: Continuity and Discontinuity in Lithic Technology at Colha, Belize

Occupation of the Maya Lowlands begins with pre-Maya populations that extend back to at least 12,000 years ago with early Paleoindians and later Archaic people. The beginnings of what we call Maya first appear around 1000 BC in the Lowlands during the Middle Preclassic. Though the Maya Highlands have evidence for the Early Preclassic, the transition from pre-Maya to Maya, 2000–1000 BC, is poorly understood in the Lowlands. Colha is a medium-sized Maya site known for its extensive Preclassic and Classic stone tool workshops. Additionally, data have been recovered for a pre-Maya occupation of the site. In this paper, we will attempt to shed light on this transition by examining continuities and discontinuities in the lithic technology from the site of Colha in the Northern Belize Chert Bearing Zone.

Hyde, David [178] see Godhardt, Ava

Hyde, David [53] see Thompson, Lauri

Hyland, Corrie (Trent University), Paul Szpak (Trent University) and Jean-François Millaire (University of Western Ontario)

[243]

High Tide and Low Tide: Variable Marine Consumption by Victims of Ritual Violence in the Virú Valley, Peru

Multi-tissue stable isotope analysis is a valuable tool to analyze subtle changes in diet, and can alter our understanding of the dietary and cultural customs of ancient societies. My research explores the diet of individuals associated with ritual violence at Huaca Santa Clara and Huaca Gallinazo using stable carbon, nitrogen, and sulfur isotope analyses. Multiple soft-tissue (hair, nail, skin, tendon, brain matter) and bone collagen samples from burials with and without evidence for ritual violence were sampled to determine the role diet played in the preparation of individuals for ritual violence during the Virú and Tomaval periods (200 BC to AD 600, and AD 750–1150) in the Virú Valley, Peru. In contrast to previous archaeofaunal research, bone collagen isotopic compositions indicated low consumption of marine resources. However, incremental isotopic analyses of hair revealed that major changes in diet before death by ritual violence were driven by variable consumption of marine protein. These results contribute to a growing body of isotopic research in the Andes suggesting that proximity to the coast cannot be universally associated with a high reliance on marine resources.

Iannone, Gyles (Trent University), Pyiet Phyo Kyaw (Mandalay University) and Scott Macrae (Trent University)

[28]

Searching for Classical Bagan's Peri-Urban Neighborhoods: Preliminary Results of the 2019 Field Season

The IRAW@Bagan project is aimed at generating an integrated socio-ecological history for residential patterning, agricultural practices, and water management at the Classical Burmese (Bama) capital of Bagan, Myanmar (eleventh to fourteenth centuries CE) across a range of significant ecological, climatic, economic, sociopolitical, and religious changes. This objective is being achieved through a settlement archaeology study within the peri-urban (mixed urban-rural) settlement zone immediately surrounding Bagan's walled and moated, regal-ritual epicenter. This discussion presents the preliminary results of the 2019 test excavations at the Shwe Creek and Otein Taung residential sites, with particular emphasis on the nature of occupation surfaces and the character of the associated features, artifacts, and ecofacts.

Iannone, Gyles [28] see Macrae, Scott

Ibarra, Thania [130] see Shaw, Justine

Ibarrola, Mary Elizabeth (University of Florida)

[213]

Placemaking in the Borderland: An Archaeology of African-Descendent People in Colonial Florida

During the colonial era, Florida was a region of constant geopolitical turmoil. The purpose of my dissertation research is to examine how people of African descent responded to and transformed this turbulent landscape. In a comparative regional study I consider the various tactics and strategies employed by people of African descent to adapt within the changing political landscape of colonial and territorial Florida through the everyday creation of place. The research examines six archaeological sites which range from the

Second Spanish Period through the Territorial Period and were occupied by individuals of varying legal and social status but overlapping ethnic and racial categorization. In this poster, I highlight particular insights gained from an examination of site distribution and site arrangement. Through this close spatial analysis, I have been able to build a better picture of spatial relationships among sites and their positioning within a physical landscape, as well as understand how that physical landscape might be manipulated to limit or encourage certain kinds of interaction. Ultimately, I hope that this research may lend insight into how internal and external pressures influence the structure of diasporic places.

Ichikawa, Akira (University of Colorado, Boulder)

[197]

The Open and Restricted Plazas of San Andres in the Zapotitan Valley, El Salvador

Plazas were important spaces for daily life in ancient Mesoamerica. However, in the Southeastern Maya area, especially in El Salvador, there have been limited studies on plazas. This paper focuses on San Andres, a ceremonial center in the Zapotitan valley during the Late Classic period, which contained two plazas in the main architectural group: the open and restricted plazas. Based on the new excavations and radiocarbon data from San Andres, this paper examines when and how these plazas were formed and interprets its social implications. Both plazas were constructed simultaneously after 650 cal AD, but with different techniques and purposes. The open plaza was covered with mud plaster and was possibly surrounded by four elite residential houses with easy access from the outside, indicating that it most likely functioned as a gathering place. In contrast, the plaza with restricted access was constructed as part of the Acropolis, with tons of adobes, practically invisible from outside the Acropolis. There exists rich ritual evidence in this plaza, which indicate that the restricted plaza was used for exclusive elite rituals.

Iglesias, Christina (California State University, Los Angeles)

[137]

Interpreting a Subterranean Feature at Chichen Itza

During the 2019 season, a subterranean feature was excavated atop a pyramidal structure in the pueblo of San Felipe Nuevo 839 m NE from the El Castillo pyramid at Chichen Itza. The entrance is a round, finely finished, chultun-like entrance 53 cm in diameter. The walls are plastered which suggests its function as a water cistern but the plaster is a mere 0.5 to 1 cm thick which is certainly too thin to prevent leakage. Additionally, the feature measures only 84 cm from floor to ceiling which makes it anomalous for a chultun. The feature was constructed in fill so it is also not a sascabera which may have a similar entrance. Its placement at the very top of a large platform provides the best clue to its function. At this point I am interpreting the feature as a small man-made cave.

Iizuka, Fumie (University of California, Merced), Masami Izuho (Tokyo Metropolitan University), Hans Barnard (University of California, Los Angeles) and Mark Aldenderfer (University of California, Merced)

[252]

Petrographic Provenance Study of the Late Pleistocene Pottery from the Soujiyama and Kenshojo-Ato Sites, Southern Kyushu, Japan

With tephrochronology, southern Kyushu of southern Japan has among the most reliable dates for late Pleistocene pottery in East and Northeast Asia. Pottery from the Incipient Jomon Period is found below Satsuma tephra dated to around 12,800 cal BP. In our previous study, we selected Incipient Jomon sherd samples from the Soujiyama and Kenshojo-Ato sites of southern Kyushu and conducted visual analyses of the inclusions. We suggested that most pottery was produced locally. For the current study, we conducted petrographic thin-section analysis of a number of sherds. The results agreed with the results of our visual analysis. Apparently, in the Late Pleistocene Period, foragers in southern Kyushu mainly used locally produced ceramic vessels.

Ikeshoji-Orlati, Veronica

[32]

Discussant

Ikeshoji-Orlati, Veronica

[51]

The San Simone Tombe a Fossa: Preliminary Analysis of Four Early Seventh-Century BCE Villanovan Funerary Assemblages

The San Giuliano necropolis, located within the Marturanum Regional Park in northern Lazio, Italy, is well-known for its hundreds of Villanovan and Etruscan graves. As part of our mission to understand the patterns of human habitation at the site from the ninth century BCE through the thirteenth century CE, the San Giuliano Archaeological Research Project (SGARP) has excavated a selection of the Etruscan rock-cut chamber tombs and Villanovan tombe a fossa (pit graves) over the past four field seasons. This presentation focuses on the material evidence from four late Villanovan tombe a fossa located on the San Simone plateau within the San Giuliano necropolis. Dating to the early seventh century BCE, the San Simone tombs are inhumation graves of three adults and one child with rich assemblages of ceramic, bronze, and amber goods. Analysis of the material remains reveals the transitional late-Villanovan to early-Etruscan nature of these tombs; in conjunction with the physical proximity and orientation of the four graves, it raises further questions about the social status and possible kinship relationships between the deceased.

Iñáñez, Javier (University of the Basque Country [UPV/EHU]), Juan Guillermo Martín (Universidad del Norte), Michael Glascock (University of Missouri), Russell Holland (University of Sheffield) and Helen Thompson (University of Sheffield)

[196]

Clay and Glaze: Similar Materials, Different Choices: Chemical and Petrographic Characterization of Pottery from Colonial Panama

Panamá Viejo was founded in 1519 by the Spanish expeditionary Pedrarias Dávila. At the time, it was the first permanent settlement in the Pacific Ocean, becoming a city by a royal decree in 1521. Shortly after its creation the city became an important base for the

trade with Spain. In 1671, the English pirate Henry Morgan attacked and sacked Panama Viejo, resulting in a fire that destroyed the entire city. Thus, a new settlement was built a few miles west, which would become the origin of the modern Panama City. An integrated analytical study of the rich pottery assemblage pottery from Panama Viejo, both glazed and unglazed, has shed light on the technological influence on American majolica and local potting traditions within the cultural frame of societies in contact in a colonial context. The supply of raw materials for the potting industry in colonial Panama is assessed diachronically from colonization, through the disruptions and eventual relocation of the city. Examining the spectrum of indigenous style pottery, colonial production and imported ceramics, this technologically based study considers the important archaeological and historical implications of these important ceramics in the Spanish colonial market within the broader region.

Ingalls, Victoria (University of Texas, San Antonio)

[158]

Ritual and Movement in the Preclassic Hinterlands of the Mopan River Valley

Evidence from the Mopan River valley continues to clarify the nature and extent of Preclassic occupation of the region. The hinterland community of San Lorenzo sits directly across the river from both Xunantunich and Actuncan, sites with substantial Preclassic construction and ritual use. Using data gathered from this ancient community, this paper focuses on the role of focal nodes within a wider landscape, analyzing the potential for movement and interactions across the built and natural environments. While not monumental in scale, San Lorenzo boasts several Preclassic structures, including a round ritual structure that was likely used for gatherings of the local community. Numerous analogous structures are documented across the lowlands, and seem to be most commonly found at or near sites that also include a Preclassic E-Group. This paper explores the role of outlying communities in the construction and use of monumental spaces, and conceptualizes how movement at different scales may shape community identity and social memory through the creation of space/place.

Ingram, Scott [214] see Paradiso, Emma

Ingram, Scott [165] see Patrick, Shelby

Inomata, Takeshi (University of Arizona)

[10]

Discussant

Inomata, Takeshi (University of Arizona)

[24]

Poor Preservation in Complex Urban Settings: Chronology-Building in the Maya Area

Archaeologists working in the Maya area face multiple challenges as they develop chronological studies. First, many sites are complex urban centers with diverse types of structures and areas. Second, these sites commonly have long occupation, involving migrations, destructions of buildings, and recycling of construction materials. Third, in this tropical environment, the preservation of organic materials is poor. To build reliable chronologies under these conditions, researchers need to have substantial data from excavation and a sufficient number of radiocarbon dates combined with ceramics studies and stratigraphic information. A particularly important issue is the identification of problematic old radiocarbon dates resulting from stratigraphic mixing. The Bayesian analysis of radiocarbon dates provides an effective tool in this process.

Inomata, Takeshi (University of Arizona)

[265]

Discussant

Ion, Rodica -Mariana [159] see Turcanu-Carutiu, Daniela

Iovita, Radu [162] see Coco, Emily

Ireland, Brenda [97] see Higgins, Howard

Iriarte, José [198] see Robinson, Mark

Isayev, Vugar [111] see Abdullayev, Rahman

Iseminger, William (Cahokia Mounds)

[164]

Cahokia-style Engraved Stone Tablets: A Study of Form and Design

Cahokia's iconic Birdman Tablet is well-known but there is a corpus of many other examples, a few with graphics on one side and the other side cross-hatched or plain; the majority have cross-hatching on one or both sides. Thus far, 28 examples of engraved stone tablets in the Cahokia style have been identified and their characteristics and proveniences, when known, documented. Possible functions will be discussed and a request for any additional known specimens that can be added to this database.

Ito, Nobuyuki (Nagoya University)**[189]***Un fragmento de estela relacionada con la fecha Bak'tun 7 en Chalchuapa, El Salvador*

En la Costa Sur de Mesoamérica, se han descubierto numerosas estelas esculpidas. Sin embargo, solamente una docena de estas se registró dentro de un contexto arqueológico del período Preclásico. No obstante, en esta región se localizan dos sitios que poseen estelas con las fechas calendáricas más tempranas del Bak'tun 7, entre estas Chiapa de Corzo y El Baúl, mientras que hacia el norte de esta región, hasta el momento solo existe un sitio identificado, Tres Zapotes en Golfo de México. En El Trapiche, Chalchuapa, se han encontrado varios fragmentos de estela al frente del Montículo E3-1, los cuales se colocaron como ofrenda al frente del acceso a la misma Estructura. Al sur de la Estructura E3-1 y frente a la Estructura E3-2, se descubrió otro fragmento de estela cuya fecha pertenecía al calendario de la cuenta larga relacionada al Bak'tun 7. En esta ponencia se presentará la evidencia arqueológica en el área de El Trapiche, Chalchuapa, que muestra la presencia de una fecha muy temprana del calendario de cuenta larga maya en El Salvador y su relación con Mesoamérica.

Ito, Yumiko [235] see Habu, Junko

Ives, John (University of Alberta)**[103]***A Canadian Perspective on Later Paleoindian Technocomplexes and Emerging Genetic Data*

Ruthann Knudson had an abiding interest in the later Paleoindian world and an affinity for Canadian research, keeping in regular touch with colleagues across the 49th parallel. Geneticists consistently identify three clades in the early prehistory of the New World: an ancient Beringian population in Alaska and early northern and southern clades south of the ice masses. The northern clade contained ancestors of the Haida, Tlingit, Tsimshian, Athapascans, Algonquians, and Salish. Early Holocene language identities are essentially beyond the range of the comparative method in historical linguistics, yet this northern clade would eventually yield the northern speech communities of the later Holocene. While it would be folly to think that it would be a simple matter to correlate technocomplexes of the later Paleoindian world with language identities, it is worth asking just which technocomplexes and social behaviors might have been involved in this time range. Eastern Beringian populations and people from south of the ice masses came into contact with each other by the fluted point era; emerging genetic perspectives should serve to sharpen our interest in subsequent Cody Complex and northern Plano manifestations, as well as intriguing toolstone distributions from this early Holocene time frame.

Izuho, Masami [175] see Gillam, J. Christopher

Izuho, Masami [252] see Iizuka, Fumie

Izzo, Victoria (Texas A&M University), John Walden, Kirsten Green, Rosie Bongiovanni and Ashley McKeown**[169]***Identifying Patterned Variability in Preclassic-Postclassic Maya Mortuary Practices in the Belize River Valley*

The Classic (AD 300–900) period Belize River Valley represents a complex political landscape of numerous semi-autonomous Maya polities. Many of these began their emergence at the end of the Early Preclassic period (1200–900BC), consolidated their political power in the Late Preclassic, underwent collapse in the Terminal Classic period (AD 750–900/1000), but then witnessed Late Postclassic reoccupation (AD 900/1000–1521). Archaeological investigations at the major centers of Lower Dover, Cahal Pech and Baking Pot have yielded a sizeable burial dataset comprising ruling apical elites from the major centers, and intermediate elites and commoners from the minor centers and households across the hinterlands. We present a meta-analysis of osteological, artifactual and contextual data gathered from burials recovered throughout these polities. We apply three multi-variate statistical techniques; principle components analysis, multi-dimensional scaling and hierarchical cluster analysis to discern broad temporal and spatial patterns in these data. Analysis allows the identification of changing burial trends over time at different hierarchical levels of society, broad spatial variability in burial customs between polities, neighborhoods and households, and an assessment of wealth investment in mortuary practices in the region.

Izzo, Victoria [178] see Messinger, Emma

Jablonski, James [176] see Casson, Aksel

Jackson, Sarah (University of Cincinnati) and Linda Brown (University of New Mexico)**[127]***Persons, Places, and Dreams: Relationships Mediated by Residential Spaces at Classic Maya Say Kah, Belize*

In this paper, we consider the ancient Maya built environment as an extension of the living landscape from which it was constructed. The built environment was a dynamic space for ongoing relationships between multiple types of persons (living, ancestral, and nonhuman). We discuss examples from our excavations at the Classic Maya site of Say Kah, Belize, where we have encountered material traces of relational persons in different forms, and evidence of ongoing, interactive relationships with them that unfolded over time. A specific focus of our discussion is the importance of residential spaces in ongoing relationships with secondary ancestral bundles, which were visited and communicated with. We interpret these burials, typically embedded within a sleeping bench, as being active communicating bundles who conversed with their descendants during dreams. We consider the role of benches and sleeping or dreaming spaces within residential structures and how these experiential environments point toward dreamscapes as important loci for relationships with ancestors and other-than-human communicating entities.

Jackson, Stephen [235] see Perrotti, Angelina

Jacobs, Iris (University of Chicago) and Vanessa Muros (UCLA Cotsen Institute of Archaeology)

[268]

Public Outreach and the Community Museum: Engaging Local Communities in Archaeological Conservation and Research

This presentation will focus on public outreach efforts undertaken by members of the Corral Redondo Archaeological Project during the 2018 and 2019 field seasons. We will discuss activities that provided opportunities to interact with students and teachers of the IE Miguel Grau school in the town of Iquipi, where the team members lived and worked. Additionally, we will discuss our community education activities related to the 'Luis Guillermo Lumbreras' community museum. Initiatives that engaged the wider community around the site of Corral Redondo and Iquipi, such as the oral history interview project associated with the museum, will also be discussed.

Jacobs, Zenobia [11] see Phillips, Natasha

Jacobson, Jodi (Center for Archaeological Studies, Texas State University), Taylor Bowden (Texas State University) and Susan Sincerbox (Center for Archaeological Studies, Texas State University)

[76]

Grease, Dogs, Rats, and Rivers: Marrow and Bone Grease Processing at the Late Prehistoric Jayroe Site (41HM51) in Central Texas

The Jayroe Site (41HM51) is a Late Prehistoric site located along the Edward's Plateau in Hamilton County, Texas. Previous analysis of faunal material from 41HM51 by other researchers noted that the assemblage was diverse with good preservation, yet artiodactyl bone was heavily comminuted. Conclusions associated with prior analyses by other researchers was conflicting. Quigg (2014) suggested fragmentation was due to marrow and bone grease extraction, while Dockall (2016) disagreed and indicated taphonomy as the primary cause. Lacking from discussions was a hypothesis for identifying bone grease manufacturing at Texas or Southern Plains sites. Seasonal differences in animal fat storage, catabolization order of fat reserves, longevity and viability of marrow and grease storage given seasonal temperature thresholds in Texas, and large scale versus small scale bone grease use and consumption should be considered. Additional factors include differentiating bone grease extraction or other intentional breakage by humans from various taphonomic variables (carnivore modification, alluvial abrasion action, etc) at the site. Results of studies by authors and methodology for identifying bone grease processing at macro and micro level are presented, including additional findings regarding potential evidence for dog domestication encountered while researching other variables.

Jaimes Vences, Gustavo [133] see Sugiura, Yoko

Jalbert, Catherine and Laura Heath-Stout (Rice University)

[72]

The Bulletin of the Texas Archeological Society: An Analysis of Authorship, 1929–2019

The data produced and disseminated by archaeologists is partly shaped by their social positions and employment contexts. Therefore, demographics have far-reaching impacts for how knowledge is constructed and received in the discipline. Recent research demonstrates that this results in a "peer review gap," wherein men and academic archaeologists are overrepresented in peer reviewed publications, while women and cultural resource management archaeologists have more representation in non-refereed venues. In this paper, we examine this dynamic using the Texas Archeological Society (TAS) and its Bulletin (BTAS) as a case study. The BTAS is considered unique in that it is one of the oldest, continually published archaeology journals in the United States (founded in 1929) and publishes editorially-reviewed articles with an optional peer review process. We will present aggregated data on longitudinal trends in BTAS publications as well as survey results of TAS members and BTAS authors. Because it is a venue for avocational, academic, and professional archaeologists, we will use this data to quantify the rates of refereed and non-refereed publications and understand how they correlate with the institutional affiliation, gender, and race/ethnicity of authors.

[72]

Chair

Jalbert, Catherine

[91]

Discussant

James, L. Brock (University of Utah Archaeological Center), Kaley Joyce (University of Utah Archaeological Center), Kate Magargal (University of Utah Archaeological Center) and Brian Coddington (University of Utah Archaeological Center)

[236]

A Stone in the Hand Is Worth How Many in the Bush? Applying the Marginal Value Theorem to Understand Optimal Toolstone Transportation, Processing, and Discard Decisions.

The acquisition and transport of material for the manufacturing of flaked stone tools comes at a cost. Numerous studies evaluate how processing may reduce transport costs, often using theoretical frameworks derived from behavioral ecology theory, typically applying central place foraging or the field processing model as a guide. However, to date these studies do not adequately address either the continued reuse of toolstone over distance and time, or the repeated use of toolstone by multiple individuals. Here we offer a novel application of marginal value theorem to lithic acquisition and conveyance. This study examines the impact of distance on processing and abandonment of lithic cores, and quantifies these spatial patterns in terms of environmental quality. Predictions

of archaeological outcomes resulting from behaviors driven by marginal value theorem are tested through an analysis of several archaeological sites in the Lower Dolores River Canyonlands Area in east-central Utah. The results support the model predictions, showing that the degree of processing represented in lithic assemblages changes as a response to the decreasing quality and abundance of available lithic material. This novel theoretical framework offers some general insights that are capable of explaining variation in the distribution of lithic artifacts across diverse archaeological contexts.

[236]

Chair

James, Nathaniel (University of California, San Diego), Isabell Villasana (University of California, San Diego), Alexia Decaix (Université Nice Sophia Antipolis), Steven Weber (Washington State University) and Jade d'Alpoim Guedes (University of California, San Diego)

[205]

Taphonomy, Labor, and Subsistence at Harappa

Harappa is a critical site in understanding the plant-human relationships that defined the increasing urbanization and eventual regionalization of the Indus Valley from 3300–1700 cal BC. The primary paleoethnobotanical methods for investigating ancient social organization have been the application of ethnographically based crop processing models. Relying on specific ratios of grains, weeds, and chaff these models are vulnerable to social and taphonomic processes such as dung burning that can obscure past activity. This paper presents an evaluation of these methods, and integrates functional weed ecology in order to disentangle both crop processing and dung burning within the macrobotanical assemblages excavated at Harappa from 1990 to 2000. Further, it attempts to disentangle how the archaeobotanical record reflects changing social organization at the site.

James, Steven (California State University at Fullerton)

[56]

Two Pioneering California Women Archaeologists, 1940s to 1960s: Agnes Bierman Babcock and Freddie Curtis

Although this may seem surprising, there were very few women California archaeologists prior to the 1940s. This presentation discusses the lives of two pioneering women archaeologists who worked primarily in Southern California from the late 1940s to the 1960s, that of Agnes Bierman Babcock (1923–2018) and Freddie Curtis (1913–1996). These two women, who are generally not well-known today, each conducted some of the first archaeological investigations at coastal and desert sites in the region. The lives of these women and their contributions to archaeology are discussed as part of this year's HAIG session celebrating early women archaeologists.

Jamieson, Zachariah

[101]

The Quantification of Fire-Cracked Rock in the Lower Pecos Canyonlands and the Edwards Plateau of Texas

Burned Rock Middens (BRMs) are one of the most ubiquitous types of archaeological sites found in the Lower Pecos Canyonlands and the Edwards Plateau of Texas. The collection of quantifiable fire cracked rock (FCR) data from BRMs allow for a meaningful comparison of earth oven baking activities occurring at different sites. Furthermore, the quantification of previous excavation methods ascertained in the literature review of documented BRMs support the standardization of methodology to aid researchers with comparable datasets. This research attempts to construct a well-documented FCR quantification dataset as well as the excavation methodology by utilizing the site Langtry Rock Midden in Val Verde County, Texas. The site is comprised of a large 1.5m high, ring-shaped midden located north of Bonfire Shelter that is on the east ledge of the Eagle Nest Canyon. Through Texas State University's Ancient Southwest Texas Project and the assistance of the Texas State University Archaeology Field School and volunteers, Langtry Rock Midden was excavated as a practical example to provide a model to standardize methodology of excavations of BRM sites through the use of SfM (Structure from Motion) photogrammetry, modern sampling methods, and Rock Sort.

Jamison, Gregg (University of Wisconsin-Milwaukee), Charles Konsitzke (University of Wisconsin, Madison), William Belcher (University of Nebraska), Brett Hoffman (University of Wisconsin, Madison) and Ella Axelrod (Colorado College)

[188]

UW MIA Recovery and Identification Project: A Multidisciplinary Approach to DPAA Partner Recovery Missions

Since 2016, the University of Wisconsin Missing-in-Action Recovery and Identification Project (UW MIA Project) has partnered with the Defense POW/MIA Accounting Agency (DPAA) in conducting field operations to recover missing American servicemembers in support of identification. Working in northern France, the project has successfully recovered the remains of two servicemembers lost during WWII, helping DPAA to achieve their goal of providing the fullest-possible accounting to families and our nation. This poster highlights our successful efforts and provides insights into the multi-disciplinary nature of the project, which includes historical research, archaeological and forensic field methods, and student training in and out of the field. Students and volunteers have gained valuable field experiences including survey, excavation, and analysis of recovered materials in the field, and developed innovative on-site recovery infrastructure that facilitates expedient operations. These successful missions influence and support our long-term goals of establishing a research institute that focuses exclusively on MIA recovery operations. The UW MIA Project provides an important case study in how to develop and implement a successful partnership with DPAA. Working together, the UW MIA Project and DPAA will continue to strive toward fulfilling our Nation's promise to bring all of our missing servicemembers home.

Janesko, Sarah (VCP, Alexandria Laboratory)

[187]

Chair

Janesko, Sarah [187] see Petrie, Jacob

Janz, Lisa (Trent University), Davahuu Odsuren (Mongolian Academy of Sciences) and Dashzeveg Bukhchuluun (Yale University)

[62]

Tamsagbulag: New Center of Cattle Domestication in East Asia?

Tamsagbulag is one of the most important archaeological sites in Mongolia and is critical to understanding non-unilinear trajectories toward sedentism and domestication. Located in the far eastern steppes, the site represents the only known evidence of sedentary hunter-gatherer communities in Mongolia. The site is famous for evidence of ritual and intensive use of wild cattle many thousands of years earlier than the introduction of western domesticates. Although we do not yet fully understand the nature of human-animal relationships at the site, new excavations strongly support the idea that the site was used year-round and that local sedentism was closely related to intensive exploitation, or even some level of management, of large game. Our research at Tamsagbulag offers many new opportunities to for understanding variation in trajectories of sedentism and domestication both within East Asia and beyond.

Janz, Lisa [62] see Dashzeveg, Bukhchuluun

Janz, Lisa [125] see Rosen, Arlene

Janz, Lisa [76] see Routledge, Jennifer

Janzen, Anneke [171] see Hildebrand, Elisabeth

Jarman, Nicholas [9] see Steffen, Anastasia

Jaskowski, Clay (University of Notre Dame) and Kelsey Reese (University of Notre Dame)

[149]

Connecting Great Houses and Nearby Sites on the Mesa Verde North Escarpment

Hundreds of ancestral Pueblo sites occupied throughout the Basketmaker III through Pueblo III period (AD 500–1300) have been recorded on the Mesa Verde North Escarpment in southwestern Colorado. Among these sites are one Chaco-era Great House, and two potential post-Chaco era Great Houses. Each of these sites were likely constructed during the Pueblo II period, but were used for differing lengths of time by their surrounding communities. By studying ceramic data associated with each of these potential Great Houses and their neighboring communities, the time period and use-life of each site within these communities will be estimated. We will also examine the population density on the North Escarpment before, during, and after Great House construction in an attempt to determine whether a high population density led to the formation of Great House communities, or if the establishment of Great Houses on the North Escarpment was the catalyst for an increased population. The results of this project will show the construction and resilience of communities on the Mesa Verde North Escarpment through time, and offer an estimate of when each of these communities were no longer being used.

Jazwa, Christopher (University of Nevada, Reno) and Ryan Anderson (Santa Clara University)

[135]

A Radiocarbon Chronology of Human Occupation in the East Cape Region of Baja California Sur, Mexico

We will develop an initial chronology of human occupation of Cabo Pulmo National Park (CPNP) in Baja California Sur, Mexico, and the surrounding coastal region. Unlike Alta California, which has received more archaeological attention, large regions of Baja California have been relatively unstudied and there is little information about when they were first occupied. We target coastal sites in CPNP, many of which have eroding escarpments with stratified deposits exposed. We apply stratigraphic relationships to AMS radiocarbon dates on multiple marine mollusk samples from coastal sites to establish the full range of occupation. These relationships are modeled using software that employs Bayesian statistics and can be used to mitigate calibration errors related to poorly understood variability in the local marine reservoir age, which has mixed carbon sources from the Gulf of California and Pacific Ocean. This will provide an important framework for future archaeological research in the East Cape region and highlight its potential for addressing broader research questions for western North America.

Jenkins, Dennis (Museum of Nat. & Cult. Hist., University of Oregon)

[19]

Discussant

Jenkins, Dennis (Museum of Nat. & Cult. Hist., University of Oregon), Katelyn McDonough (Texas A&M, Center for the Study of First Americans), Richard Rosencrance (Museum of Nat. & Cult. Hist., University of Oregon) and Justin Holcomb (Boston University)

[170]

Current Investigations at Connley Cave 5, Fort Rock Basin, Oregon: A Series of Late Pleistocene Western Stemmed Tradition Occupations

University of Oregon field school investigations continue (2000–2001, 2014–2019) at the Connley Caves in the Fort Rock basin of south-central Oregon. First investigated by Stephen Bedwell in 1967–1968, these caves revealed large, deeply buried, and stratified Western Stemmed Tradition (WST) assemblages possibly dating to as much as 11,200±200 14C BP. However, beginning in 1967 Bedwell excavated in an expedient manner involving shovels, arbitrary 10 cm levels, and backhoe removal of 230 cm of post-Mazama deposits. He recovered inverted radiocarbon dates in caves 4, 5, and 6 as a consequence and confidence in his work has

been justifiably low. Here, we report more nuanced investigations in a previously undisturbed rockshelter attached to the east side of Cave 5. Specifically, we present the current stratigraphic and geochronological framework, provide an overview of the archaeology at the site, and discuss future research initiatives. Our intention is to refine the geochronology, more fully understand site formation processes, culture-history, settlement-subsistence, and lithic and osseous technology records for this truly impressive WST site.

Jenkins, Jessica [251] see Gallivan, Martin

Jenks, Kelly (New Mexico State University)

[165]

Investigating Parajes: An Exploration of "Camping" Sites on the Camino Real

For three centuries, El Camino Real de Tierra Adentro National Historic Trail served as the main wagon road transporting people and merchandise between the New Mexico colony and the interior of New Spain. Most archaeological investigations of this trail have focused on only two types of sites: actual trail segments, and associated camping areas known as "parajes". Knowledge of these paraje sites comes mostly from Spanish colonial- and Mexican-period travel accounts, which name and briefly describe several camping areas regularly used by travelers in the long stretches between colonial settlements. Reconnaissance surveys along the trail have revealed a more complicated pattern of trail-related activity, however, with numerous sites that vary in scale, content, and date. This paper investigates the concept of parajes and presents a more nuanced way of thinking about the types of sites associated with travel.

Jennings, Justin (Royal Ontario Museum), Aleksa Alaica (University of Toronto), Matthew Biwer (University of California, Santa Barbara) and Oscar Huaman (Quilcapampa Archaeological Project)

[86]

A Final Feast: Molle Beer, Camelid Meat, Smashed Pots, and the Closing of Short-Lived Site in Middle Horizon Peru

In this paper, we reconstruct the final moments of Quilcapampa's ninth century AD occupation. A group of Wari colonists had founded the site on the coastal plain of southern Peru as little as a generation earlier, and in the ninth century were ceremonially abandoning the settlement by drinking beer, eating meat, smashing pots, making fires, sealing doorways, and laying down fills. We highlight beer's essential role at the event—its preparation, consumption, and disposal—and discuss what the beverage can tell us about Quilcapampa's residents and their relationships to each other, local groups, and the Wari state.

Jennings, Justin (Royal Ontario Museum)

[268]

Discussant

Jennings, Thomas [232] see Jones, KC

Jennings, Thomas [17] see Smallwood, Ashley

Jensen, Anne (University of Alaska Fairbanks/Bryn Mawr College)

[9]

Vulnerability and Values: Things to Consider for Site Prioritization

Archaeological sites being threatened in various ways by accelerating environmental change. The scale and urgency of the threat requires new models for funding, education, and recruitment of staff, engagement with the public and long-term curation of rescued samples. One critical issue is how to prioritize sites for recording or salvage, since we cannot save them all, or even come close. To be able to use limited resources for the maximum benefit of all stakeholders, a broadly applicable transparent prioritization scheme is highly desirable. This poster will focus on what sorts of things should be considered in prioritization to achieve this goal.

Jensen, Anne (University of Alaska Fairbanks/Bryn Mawr College)

[220]

Moderator

Jepsen, Jacob (Brigham Young University), Scott Ure (Brigham Young University), Ridge Anderson (Brigham Young University) and Michael Searcy (Brigham Young University)

[147]

Heat Seekers: An Experiment to Identify Prehistoric Architectural Features Using Aerial Thermography

Advances in thermal camera capabilities, improved dependability of unmanned aerial systems, and the increased capabilities of various software packages are revolutionizing the collection, processing, and analysis of aerial thermal imagery. This poster shares the results from an experiment developed by the authors to examine the parameters required for successful archaeological aerial thermographic imaging. Following previous experiments and research in archaeological aerial thermography, we created a six-month-long controlled experiment to determine to what degree environmental and climatic conditions impact buried archaeological features using aerial thermographic imagery. Our results show that some conditions and environments are more conducive to identifying buried ephemeral archaeological features than others. We conclude that ground cover, soil composition, soil temperature, soil moisture, feature depth, feature type, and time of day significantly impact whether a buried archaeological feature is visible using aerial thermography. As with most remote sensing, even the most ideal conditions do not always yield useful results; however, we suggest that in some circumstances archaeological aerial thermography can successfully record the thermal signature of shallowly buried archaeological features.

Jeremiah, Kristen (Public Archaeology Laboratory Inc. [PAL])**[176]***Examining Exploited Resources from a Selection of Archaic Sites in Eastern Connecticut*

This poster summarizes how organic and lithic analyses were employed to help interpret Native American settlement and subsistence practices during the Archaic period in eastern Connecticut. Research conducted by The Public Archaeology Laboratory, Inc., for proposed utility lines in the northeastern U.S. indicates that seasonality impacted site selection and that inhabitants were reliant on diverse marine and terrestrial resources. These interpretations were based on floral and faunal identification, radiocarbon dating of charred floral remains, blood residue analyses on stone tools, and lithic raw material choice. These analyses were applied to a selection of sites in the Thames River drainage basin, and findings at these sites were then compared.

Jerrems, William and Amy Dansie (Nevada State Museum, Retired)**[198]***More Bits and Pieces: Twenty Years of Lahontan Basin Paleoindian Research*

It appears that a pre-Clovis entry into the Americas (pre-13,500 cal BP) occurred across Beringia most likely by intermittent boat ventures along parts of the North American coastline. The Yana Site (western Beringia) above the Arctic circle at 32,000 rcybp sets a potential trajectory for human entrance into North America (eastern Beringia). Bluefish Caves evidence humans in eastern Beringia at 24,000 cal BP, referred to as the Beringian Standstill model. Ultimately, settlements along the coastal route initiated a movement into the continental interior potentially as early as 16,000 cal BP, as evidenced at the Coopers Ferry Site in northern Idaho and Paisley Five Mile caves at 14,500 cal BP. A reevaluation of the dates of the last high stand of Pleistocene Lake Lahontan, northwestern Great Basin, has resulted in a twenty-year research project that restructured the chronology of lake level rises and falls. Lake levels made dramatic fall at 13,070 RCYBP (16,000 cal BP), which is contrary to the belief that a highstand occurred during the Younger Dryas (12,000 cal BP). Focusing on the Lahontan basin of northwestern Nevada, we see strong evidence of a very early entrance into the interior lands of North America.

Jeske, Robert (University of Wisconsin, Milwaukee) and Richard Edwards (Commonwealth Heritage Group)**[264]***Is Mississippianization a Thing? Testing the Spread of Innovation and Cultural Contact in the Eleventh-Century American Midwest*

Mississippianization is often treated as an homogenized wave of influence emerging from the American bottom to transform Northern groups into imitations of Cahokians. These hinterland people began using shell-tempered pottery and decorative motifs that appear to have symbolized Mississippianess. This influence has been portrayed as an epidemic spread of innovation, or as migration, and/or missionization that fueled conversion to Mississippianized lifeways. However, these models remove agency from people outside of the American Bottom. Recent data indicate that cultural change occurred in discontinuous and divergent patterns—and that many traits exemplified by Upper Mississippian groups occurred earlier or concurrently in the Hinterlands and American Bottom. Furthermore, Cahokia-related artifacts are rarely found north of the Central Illinois and Apple River valleys with few exceptions (Aztalan, Fred Edwards, Trempealeau). That these outlier sites appear to have extremely limited interaction with neighbors belies the notion of a unidirectional wave across cultural boundaries. The appearance of Upper Mississippian material culture shortly after AD 1050–1100 is likely tied to a pan-continental shift in ideology entrained to subsistence and settlement shifts that took hold and resulted in regionally diverse expressions due to local historical tradition, environments, and network associations.

Jeske, Robert [264] see Edwards, Richard

Jessamy, Michael [60] see Hayward, Michele

Jeu, Michael (Eastern New Mexico University)**[6]***An Experimental Spatial Analysis of Lithic Discard at Hunter-Gatherer Sites*

As prehistoric hunter-gatherer manufactured and rejuvenated stone tools, they left behind traces of these behaviors in the form of spatially patterned lithic debris. Such patterns have been carefully studied and applied to models such as Binford's (1978) Lithic Drop Zones. GIS analysis of the spatial arrangement of debitage provides a digital method for comparing stone-tool reduction episodes from various hunter-gatherer site types. Today, flintknapping remains a popular past-time among skilled craftspeople around the world, but have our habits changed? This poster presents an experimental analysis testing models of lithic-discard behaviors that occurred at prehistoric versus a modern flintknapping site to see if the spatial arrangement of debitage resulting from modern behavior significantly differs from that of the past. Obsidian cores were reduced modern flintknappers and the provenience of all lithic debris was collected and spatially modeled using ArcGIS. Results were compared to published models of Lithic Drop Zones and spatial data collected at archaeological sites. An attribute analysis was also conducted on each lithic piece generated by the two modern day flint-knappers to test for correlations in spatial patterning between prehistoric and modern lithic reduction sites.

Jijon, Juan**[257]***Lidar Application in the Cerros Hojas-Jaboncillo, Manabi, Ecuador*

Currently, precise and high-resolution lidar data are increasingly significant for the detection of archaeological settlements. We are presenting the preliminary observations resulting from the lidar flight carried out by the IGM (Military Geographic Institute of Ecuador) in the summer of 2016. The incidence of this study is a priority for updating the Patrimonial Polygon of the Cerros Hojas-Jaboncillo, which was delimited in 2009. Thanks to the lidar technology it has been possible to detect a series of landscape

modifications of prehispanic origin. This technology also allows the verification of the progress of quarry companies of stone material that are exploiting the Hojas-Jaboncillo massif and, therefore, new prospects for heritage conservation are increasingly effective.

Jimenez, Socorro (Universidad Autónoma de Yucatán), Charles Golden (Brandeis University) and Andrew Scherer (Brown University)

[126]

The Ceramic Laboratory of FCA-UADY: The Influence of R. L. Bishop on the Ceramic Technology Studies in the Usumacinta River Basin of Chiapas, Mexico

This talk details the results of ceramic studies in the Usumacinta River Basin of Chiapas, Mexico from 2011–2019, carried out by the Proyecto Arqueológico Budsiljá-Chocoljá (PABC). This ceramic research represents a collaborative effort led by investigators at the Ceramic Laboratory of the Facultad de Ciencias Antropológicas de la Universidad Autónoma de Yucatán (FCA-UADY) in collaboration with archaeological fieldwork led by scholars from Brandeis and Brown Universities among other institutions. Since 2004, Ronald Bishop has been one of the principal promoters for the creation of the FCA-UADY Ceramic Lab in Merida, Yucatán. The physical reference collections of the PABC are organized in the laboratory using technological attributes, chronology, and archaeological contexts using methodologies based on those pioneered by Ronald Bishop and Robert Rands. In this paper, we present the results of our analyses, focusing on technological differences among ceramics to resolve regional problems of chronology and processes of manufacture, as well as questions surrounding political integration and boundary making among ancient societies in this vast region.

Jiménez, José Concepción [101] see de la Rosa, Yuri

Jiménez González, Rocío (Posgrado en Antropología)

[10]

Las figurillas de Xalla, Teotihuacan

Las figurillas cerámicas que muestran una gran diversidad de apariencias son testimonios silentes pero tangibles de las maniobras culturales de antaño. Podríamos decir que son un repositorio de memoria. En ellas se expresan ideas convencionalizadas durante un tiempo específico, lo que las vuelve un medio para estudiar la sociedad que las creó. Los rasgos corporales, los tocados, los peinados, los atuendos, los tratamientos a los que fueron sometidas, así como el contexto en el que fueron depositadas, nos ayuda a identificar normas sociales y diferentes prácticas cotidianas. En este trabajo se analiza la presencia de diferentes tipos de figurillas cerámicas y su relación con las variadas formas de inhumación en Xalla. Se identificarán las permanencias y los cambios impresos en estos materiales durante las fases Tzacualli, Tlamimilolpa y Xolalpan, con la finalidad de distinguir dinámicas de cambio y transformación social, intentando a la par, definir el uso/función de las figurillas en este conjunto palaciego, a partir del depósito en el que fueron colocadas y por el tipo de tratamiento al que fueron sometidas.

Jiménez Pasalodos, Raquel (University of Valladolid / University of Barcelona), Tommaso Mattioli (University of Barcelona, Spain), Laura Coltofean-Arizancu (University of Barcelona, Spain), Andrzej Rozwadowski (Adam Mickiewicz University in Poznan, Poland) and Margarita Díaz-Andreu (ICREA & University of Barcelona, Spain)

[25]

The Spirits Listen: Ethnographical Accounts of South Siberian Soundscapes

Ethnographies and ethnohistorical sources invariably reveal the cultural importance of landscapes and their sacred places in southwestern Siberia. These sacred places, which include mountains, caves, and rocks, are not always silent. Thus, mythical, metaphoric, and real acoustic phenomena become intertwined in folktales, myths, and ethnographic accounts. Sounds and acoustics may therefore become bridges between ecology and cosmology, creating and reinforcing myths in a process similar to that occurring elsewhere in the world, as the research of anthropologists and ethnomusicologists has shown. The “singing” landscapes are also closely connected with musical aesthetics, as the imitation of natural sounds is present in a varied range of vocal and instrumental music both implicitly and explicitly. This paper aims to explore the “singing” landscapes of southwestern Siberia, both in the past and present, in the framework of the research undertaken in the ERC Artsoundscapes Project. It will do so by considering information gathered from travel accounts, old and modern ethnographies, as well as ethnographical interviews carried out in the Altai Republic.

Jodry, Margaret

[170]

A Smithsonian Perspective on 40 Years of Cooperation and Collaboration with Mike Collins

This paper discusses the contributions of Mike Collins to the Smithsonian Institution's Paleoindian Program across 40 years. Mike was a valued colleague of Dennis Stanford in their cross-fertilized pursuit and understanding of the pre-Clovis archaeological record of the Americas from Monte Verde in Chile to the Chesapeake Bay of Virginia and Maryland. Mike also served as a mentor and colleague of Pegi Jodry from her studies of Folsom Archaeology in the mountains of Colorado to a re-analysis of the San Patrice Double Burial at the Horn Shelter site, Texas. We gratefully thank and cheerfully salute this consummate scholar, supporter, and friend by sharing views from the field, research results, and tales from the front lines.

John, Christian [189] see Mejía Ramón, Andrés

Johnen, Connor, Michael Prouty (Alpine Archaeological Consultants) and Matthew Landt (Alpine Archaeological Consultants)**[147]***Droning On about GIS: Three Cases of Using Spatial Technology to Analyze the Past*

Alpine Archaeological Consultants, Inc. has been using spatial technology to assist their studies of the past. This poster details three case studies that detail Alpine's use of technology to understand and visualize archaeological remains. At the Escalante Game Drive Site in western Colorado, we used drone technology to create a fine-grained DEM overlay for the site to analyze least-cost paths and help us understand how blinds/walls take advantage of natural corridors. At the Frances Townsite in central Colorado, we utilized lidar data to identify potential historic features and assess the size and nature of the site. We also used least-cost path analysis to help understand decision making along the Old Spanish Trail in western Colorado.

Johnson, Adam (Southern Methodist University), Thegn Ladefoged (University of Auckland) and Mark McCoy (Southern Methodist University)**[262]***Settlement Pattern Archaeology Revisited: Coastal Households in Leeward Kohala, Hawai'i Island*

The distribution of ancient Hawaiian households in the leeward Kohala region of the Island Hawaii has been examined for over fifty years. The combination of academic research and applied CRM projects has provided a wealth of information about ancient settlement patterns and how households were distributed on the landscape. Legacy data includes analog and digital records retained by individuals and various institutions. In this paper, we discuss how analog and digital legacy data are being integrated with new digital data from leeward Kohala first studied a half-century ago. We also discuss how early digital legacy data are being leveraged and adapted to advance current research in the region. Lastly, we discuss how new digital technologies are being used to gather data on coastal residences in leeward Kohala.

[262]*Chair*

Johnson, Amy [167] see Peterson, Ryan

Johnson, Ann**[103]***Rediscovering the Anzick Site*

More than 50 years ago, a large Clovis lithic cache with foreshafts and human skeletal material from two individuals was discovered at the Anzick site. This is the oldest site in Montana with two radiocarbon dates (10,705±35 and 10,780±40 RCYBP), but very few details beyond the dates and photos of the bifaces were available about the site. We report the geoarchaeological investigation by John Albanese along with photographs and details of the University of Montana work of the site in 1969, the fall the site was identified. Recent DNA testing of the skeletal remains indicate a relationship with group(s) crossing the Bering Land Bridge to populate North America.

Johnson, April (Dartmouth College) and Deborah Nichols (Dartmouth College)**[5]***Near or Afar: a Source Study of Common Ceramics from Classic Teotihuacan*

Teotihuacan was the most populated and influential urban center in the Basin of Mexico in Classic Period Mesoamerica. While it is clear this city was significant, how it influenced nearby peri-urban and rural areas is still hotly debated. To untangle the complex relationship between this city and its countryside, The Valley of Teotihuacan was surveyed extensively in the 1960s by William Sanders. In this study, common pottery samples from Sanders' excavations underwent Neutron Activation Analysis (NAA) from the city, as represented by Maquixco Bajo, and its the broader valley represented by the sites of Venta de Carpio, Tlaltenco, Tenango, and Los Cucucillos. These sites were chosen because they are located across the valley, spanning from the northern mountain slopes to the lakefront, with the goal of obtaining a more detailed understanding of pottery exchange in this region during the Classic period. This study focuses on Teotihuacan style pottery, as this type has largely been assumed to be locally produced. This study utilizes the database from the University of Missouri Research Reactor (MURR) which contains over 10,000 Mesoamerican samples and 2000 Teotihuacan samples to source the pottery from the Valley of Teotihuacan to likely areas of origin.

Johnson, Benjamin [203] see Cannon, Molly

Johnson, Eileen [103] see Hurst, Stance

Johnson, Eileen [165] see Jones, Lila

Johnson, Elizabeth (Thunderbird Archeology/WSSI)**[172]***Digging Out: Finding Creative Solutions to Four Decades of CRM Collections*

When Wetland Studies and Solutions, Inc. purchased Thunderbird Archaeology in 2004, they found themselves responsible for some 800 boxes of artifacts from more than four decades of CRM projects. The story isn't an uncommon one...boxes of CRM projects sitting in basements, sheds, storage units, or warehouses in various states of curation; however, the way WSSI handled this responsibility was somewhat unique. Challenges were encountered every step of the way, from documenting exactly what we

had and in what condition, to locating corresponding field documentation, to bringing the projects up to current curation standards. Just when we had resolved these issues, a recession came along that created a whole new set of legal issues involving companies going out of business, merging, and, in some cases, questions regarding property ownership. Faced with legal, ethical, and financial challenges, we worked to find creative solutions to finally placing these collections in permanent curation repositories.

Johnson, Heather [256] see Baxter, Carey

Johnson, James (University of Wyoming)

[205]

Bronze Age Pastoralists and Craft Production in the Southern Urals Region of the Russian Federation, ca. 2100–900 BC

In 2011, a systematic regional pedestrian survey was implemented in the Uy River valley of the southern Urals region of the present-day Russian Federation. The research questions that motivated the survey centered on investigated the possibilities of center-hinterland dynamics in Middle, Late, and FBA Bronze Age pastoral societies (MBA, LBA, FBA, respectively). While that question was answered definitively, subsequent questions emerged based on the analysis of pottery sherds collected during that survey asking how pottery was used as a means of social integration within and between the identified pastoral communities. Based on that early ceramic analysis, clear trends in pottery production revealed that paste recipes were established, used, and reused over more than 1,000 years by multiple iterations of Bronze Age communities. In 2019, excavations were undertaken at the late MBA-LBA-FBA site of Chernorech'ye 2. Recovery and analysis of the pottery confirmed the presence of the paste recipes. In this presentation, I explore the socio-political and economic contexts of these recipes and their impact on interpretations of Bronze Age pastoral social life.

Johnson, John (Santa Barbara Museum of Natural History)

[173]

Linking the Past to the Present: Collaborative DNA Research with Native Californians

At the time of European contact, a high degree of linguistic diversity existed in Native California, implying a long prehistory of different ethnic groups migrating into the region. Previous research, using mitochondrial DNA samples contributed by living descendants, produced correlations between certain genetic markers and populations that spoke related languages. The advent of ancient DNA testing not only permits an increased understanding of past genetic diversity within particular cultural groups, but also demonstrates continuity of certain genetic lineages between ancient populations and tribal descendants today. Such studies benefit California Indians by validating ancestral connections to tribal homelands, thereby providing a scientific basis for establishing cultural affiliation and descendency as defined by federal and state laws.

Johnson, Lisa (University of Nevada, Las Vegas), Felipe Trabanino (Jardin Botanico CECON-USAC), Eloi Berube (McMaster University) and Eos López Pérez (Laboratorio de Prospeccion Arqueologica IIA-UNAM)

[211]

The Microarchaeology of Ritual at the Classic Maya City of Palenque

This paper presents the results of a series of microscopic methods including micromorphology, soil residue analysis, and paleoethnobotany that were carried out on ritualized contexts in two mausoleum structures of an elite household of Palenque. We propose a theoretical and methodological approach to the study of ritual that does not privilege the visible and the durable but instead attends to a wider scope of materials often including foods, resins, fire and smoke. Central to our practice of a microarchaeology of ritual are the concepts of ritualization and materiality, which posits that elaborated actions will produce elaborate material signatures. We will consider the challenges we encountered when employing these methods in particular contexts as well as strategies for improvement in future studies.

Johnson, Nadia [189] see Mejia Ramón, Andrés

Johnson, Phyllis (Vanderbilt University) and Markus Eberl (Vanderbilt University)

[232]

Using Microdebitage to Identify a Potential Non-elite Obsidian Workshop at the Late Classic Maya site of Tamarindito

In 2012, the Tamarindito Archaeological Project uncovered a cache of 224 obsidian prismatic blades and 18 polyhedral cores in an annexed room of Structure 5PS-d in the southwest quadrant of the site. As the largest assemblage of obsidian recovered in any excavated context at Tamarindito, soil samples were analyzed for microdebitage to test the theory that this structure served as an obsidian workshop.

Johnson, Rachel (Tulane University) and Jason Nesbitt (Tulane University)

[5]

A Comparison of Ceramic Compositions from Canchas Uckro (Ancash) and the Cave of the Owls (Huánuco), Peru: Implications for an Upper Amazon Interaction Sphere

Despite decades of archaeological research, Chavín de Huántar's connections to the eastern Andes and Upper Amazon remain underexplored. Stylistic and compositional comparison of ceramics from the sites of Canchas Uckro (ca. 1100–850 BC), a large monumental platform situated above the Puccha River about 25 km north of Chavín de Huántar, and the Cave of the Owls, located on the Monzón River near modern-day Tingo María, help to clarify the nature of interaction in this region during the Formative Period. The study reanalyzed ceramics from the Cave of the Owls, housed as the Ross Collection at the University of California

Berkeley's Hearst Museum, using a Dinolite handheld microscope to conduct descriptive paste analysis focused on mineral non-plastic inclusions, clay characteristics, and superficial decorative elements. These results were then compared with a prior Dinolite study of stylistically similar sherds from Canchas Uckro with zoned-hatching motifs similar to the Wairajirca style of the upper Huallaga region. While the pottery broadly demonstrate different technological styles, the joint use of granodiorite and red sandstone inclusions suggests access to similar raw materials that may support previous hypotheses of an interaction sphere linking the eastern Andes of north-central Peru and the Upper Amazon during the Formative Period.

Johnson, Royce (Boise State University)

[235]

Use of Camas in Southern Idaho in Prehistory

Camas (*Camassia quamash*) is well documented as a traditional food source throughout the Northwest United States and Canada. Research on the Northwest Coast has provided a vast amount of literature about the importance of camas as a traditional food source and the potential for impressive rates of return. This research on the Northwest Coast has been used as an analogue to talk about the use of camas in Southern Idaho. However, differences exist in the environment and the foraging patterns between these two areas. This paper examines those differences and how they can affect the productivity and use of camas. These differences demonstrate a need for a more critical evaluation when looking at the use of camas in Southern Idaho during prehistory.

Johnson, Sarah [264] see Mollerud, Katy

Johnson, Taryn (Texas A&M University) and Anna Linderholm (Texas A&M University)

[244]

The Prehistoric Diet: Genomic Analysis of Bonneville Estates Paleofeces, Nevada

The genetic composition of paleofeces from Bonneville Estates Rockshelter (BER) can aid environmental and dietary reconstruction, as the genomic content of coprolites change as environmental conditions shifted from cool and moist in the Pleistocene to hot and dry in the Holocene and as new food sources appeared locally. In order to analyse the potential shift in taxonomic diversity and genetic biodiversity present in prehistoric diets and microbiomes of the human occupants over this transitional period, ancient DNA was extracted from over forty BER paleofecal samples that date between the Paleoindian and Archaic periods of western North America (12,500–1000 years ago). Taxonomic identifications of floral and faunal, and microbial parasite contents were given at the family and genus level. Results were compared to analyse how Archaic diets shifted through occupation. Further research will be done to determine if additional shifts, be they cultural, populational, or otherwise occurred alongside the dietary one. Broader applications of this study engage with the effect climate change can have on floral and faunal populations and how humans have interacted with the biotic parts of their environment both physically and microbially, leading to greater understanding of past and present relationships between humans and their ever-changing environment.

Johnson, Taryn [19] see Linderholm, Anna

Johnson, William [19] see Cordova, Carlos

Johnston, Elizabeth (University of Manchester, UK) and Michael Buckley (University of Manchester, UK)

[244]

Use of Proteomic Methods for Biological Age Estimation at Death

Biological age at death (AAD) is an important component of the biological profile, to aid investigators in cases with skeletal remains, also in archaeology to aid establishing site context. Current methods rely on predictable patterns of bone or teeth mineralization, growth, and fusion or damage over time, though these methods are often subject to inter-/intra-observer error and can only provide adequate data for juvenile remains; leaving adult remains with wide age ranges that do not support investigators. This has led forensics to study archaeological analytic methods of ancient biomolecules, such as DNA and proteins, which are frequently well preserved within bone to allow a host of analytical methods. Previous research has demonstrated applicability of proteomics in forensics and that proteins undergo age-dependent changes by comparing middle to end of long bones. In this research, we used proteomic methods to study changing protein abundances between entire skeletal elements from rats of different ages, to view changes over time. We also compare proteomic methods with other approaches to estimate AAD via amino acid decay, evaluating the most appropriate for forensics. A standardized method of AAD estimation with proteomics is necessary to bring proteomics to forensics as a validated method of age estimation.

Jolie, Edward (Mercyhurst University)

[236]

Textile Impressions in California Archaeology: Analytical Considerations and Research Potential

In the absence of exceptional preservation, data on ancient textile industries can be recovered from intentional and accidental negative impressions of woven products left in media that are plastic or pliable initially, but which harden later. However, detailed study of textile impressions remains uncommon across much of the western United States. In California, where surviving organic artifacts are generally quite rare, impressions in asphaltum (bitumen) provide an alternative, complementary means of acquiring data on textile crafts that are increasingly recognized for their potential to contribute to essential questions about daily life, technological change, and social boundaries and identities. In this paper, I review the major analytical considerations attendant to impressions analysis and explore the underappreciated research potential of textile impressions. Drawing on recent results from the detailed analysis of assemblages of textile impressions in asphaltum from two sites in California, I offer methodological suggestions

and review the salient interpretive inferences from these studies that stand to enhance the research potential of similar assemblages.

Jolly, Sarah (University of Pittsburgh)

[243]

The Use of Human Remains in Domestic Ritual at the Early Farming Village of Waywaka (Andahuaylas, Peru)

The site of Waywaka (Andahuaylas, Apurímac) in the south-central Peruvian highlands was occupied for 3500 years. During the earlier phases of occupation, regionally known as Muyu Moqo (ca. 1700–600 BC) and Qasawirka (ca. 300 BC–AD 600), Waywaka's inhabitants experienced the first aggregation into a sedentary village, a growing population, increased reliance on domesticated plants and animals, and greater craft production and specialization, trends that intensified during the Qasawirka period. Recent excavations uncovered a minimum of 19 human burials dating to these two periods from both primary and secondary mortuary contexts, the latter including skull offerings, foundational offerings, and the deliberate association of parts of bodies with ritual artifacts. Through mortuary and bioarchaeological analyses of contextualized human remains, this study investigates differences and changes in mortuary treatment and bioarchaeologically observed lifeways with particular emphasis on the use of human remains in domestic rituals. Situated within the broader context of ritual activity at Waywaka, this analysis examines how individuals were buried, who was considered appropriate to be interred in certain contexts, and the types of rituals that incorporated parts of human bodies to inform on the kinds of social differentiation that developed in an increasingly complex, agricultural village.

Joly, Delphine and Robert Marchant (University of York)

[74]

Fuel Management in South American Deserts: Environmental Constraints and Cultural Choices

Studying fossil fuelwood offers a unique way to understand how humans interact with their close environment. South America deserts are characterized by a low diversity and patchy availability of trees and shrubs; which impacts the ways humans managed plant resources, with this significance changing over time. Excellent preservation of plant remains in desert environments allows us to analyse charcoal and sub-fossil wood present in archaeological sites. The taxonomic identification and the observation of a range of anatomical and environmental characteristics in anthracological studies can shed light on the use, the knowledge, and the management of the woody environment by human societies during a long and diverse history of occupation. We present results of the anthracological analysis of charcoal remains from a selection of archaeological sites from the Atacama desert in Chile, coastal desert of Peru and dry puna in Argentina. The combination of sites allows us to understand how societies manage their firewood resources, to reconstruct the woody environment and chart how this evolved in response to environmental change and human use.

Jonassen, Alexandra (University of California, Riverside) and Kenichiro Tsukamoto (University of California, Riverside)

[7]

Application of the Geospatial Method to On-Floor Assemblages: A Case Study from the Classic Maya City of El Palmar, Mexico

On-floor assemblages provide clues as to how complex administrative and domestic activities interplayed within a structure. By combining photogrammetry, total station, and GIS, we developed a geospatial method that plotted each on-floor remain accurately on a GIS map. This poster presents its application to horizontal excavations that took place at the Guzmán Group, an outlying group of the Maya archaeological site of El Palmar, Mexico. During the 2019 summer season, the excavations uncovered the south room of Structure GZ7 with new glyphic texts carved on a curtain holder. The texts suggest that this room was occupied by a young member of non-royal elite lakamob (banner-bearers) who played critical roles in dynastic alliances during the Late Classic period (AD 600–800). After the excavations, attributes of these on-floor materials were connected to their locations in the GIS map which allowed for in-depth artifactual and spatial analyses of the structure. The results provide new insight into our nuanced understanding of Classic Maya banner-bearers' ritual, administrative, and daily practices.

Jones, Ashley (Moore Archeological Consulting Inc.), Kristen Hickey (Rice University) and Stephanie Orsini (Moore Archeological Consulting, Inc.)

[241]

Pigs to Possums: Foodways at Plantations in Louisiana and Texas

The material culture at plantation sites in Texas and Louisiana provides data on the lifeways of both plantation owners and the enslaved. Plantations in Texas were established in the 1830's, by planters immigrating from the Southeast. After emancipation, freedmen continued to live and work on some plantations as tenant farmers through at least the 1890's. Although much has been learned from the material culture assemblages at these sites, the faunal assemblages from Texas sites have not been subject to in-depth analyses. Data from plantation sites in Texas will be compared to analyzed assemblages in Louisiana in order to understand dietary choices of enslaved and tenant farmers. The faunal assemblages illuminates the utilization of both domestic and wild animals by slaves and tenant farmers. Domesticated species are represented largely by pigs, cows, and chickens. Wild fauna identified includes possum, rabbits, squirrels, turtles, fish, and birds. This diverse representation of species, paired with age and butchering data from domesticated species, suggests self-provisioning of enslaved and, later, tenant communities.

Jones, Bradford (Texas Historical Commission)

[89]

Discussant

Jones, Bradley Chase [242] see DeOrbegozo, Mary Emma

Jones, Brain [11] see Phillips, Natasha

Jones, Catherine (University of Wisconsin-Milwaukee)

[80]

Grave Anatomy: Dissecting Bodies of Meaning in Historic Burials

Commingled and multiple burials from historic era cemeteries contain a large volume of potential data which can contribute to a richer interpretation of site practices. Burial grounds such as the Milwaukee County Poor Farm Cemetery often contain interments comprised of multiple individuals represented by both complete and partial remains. While the basic tenants of mortuary theory push us to find cultural meaning in the placement and arrangement of the commingled dead, archaeologists must also be cognizant of the pitfalls inherent in reading intentional treatment in the arrangement of partial human remains. Utilizing archaeological, spatial, and osteological evidence, this research examines the microcosm of a single commingled burial assemblage in an effort to determine the variable layers of meaning that can and cannot be observed, as well as the potential for one burial to reflect the composition and complexity of burials in the wider site.

Jones, Douglas, Melanie Damour (Bureau of Ocean Energy Management) and Jason Chaytor (U.S. Geological Survey)

[18]

X Marks the Spot . . . For Now: Subsea Mudflows and Moving Shipwrecks on the Mississippi River Delta Front

On May 12, 1942, the 500-foot-long, steel-hulled tanker Virginia was sunk by the German U boat U-507 off the Mississippi River's Southwest Pass. The shipwreck was discovered in nearly 300 feet of water during a 2001 oil and gas survey and was investigated by a remotely operated vehicle in 2004. A 2006 geophysical survey found that the shipwreck had moved more than 1,200 feet downslope in only two years. A 2017 survey by the U.S. Geological Survey in collaboration with the Bureau of Ocean Energy Management found that Virginia had moved another 200 feet. The Mississippi River Delta Front is a highly dynamic environment prone to mudflow events triggered by hurricanes, winter storms, river floods, and other less-understood processes. Oil and gas infrastructure and submerged cultural resources in this area can be impacted by these events, and Virginia is not the only historic shipwreck that appears to be moving across the seafloor. This paper will address the challenges of managing submerged cultural resources that do not stay in one place and will discuss emerging questions, technologies, and future research opportunities to study this phenomenon.

Jones, Douglas [18] see Damour, Melanie

Jones, Emily Lena (University of New Mexico) and Jonathan Dombrosky (University of New Mexico)

[171]

Environmental Risk and Culture Change in the Middle Rio Grande Valley of New Mexico

The archaeology of the Pueblo IV or Classic Period (AD 1350–1600) Middle Rio Grande Valley is marked by significant change. Population aggregation, new subsistence patterns, and new iconography distinguish Pueblo IV sites from those that came earlier. Shifting environmental conditions, notably improved aquatic habitat quality, may be the key to understanding the development of new risk management strategies during this time. In this paper, we assess the role environmental risk management played in precipitating the changes observed in the Pueblo IV Middle Rio Grande archaeological record. We use three lines of evidence—settlement patterns, the mammalian zooarchaeological record, and the ichthyofaunal zooarchaeological record—to assess the relationship between environmental change, risk management, and Pueblo IV culture change in the Middle Rio Grande Valley.

Jones, Emily Lena [119] see Bethke, Brandi

Jones, Emily Lena [129] see Kirk, Scott

Jones, George (Hamilton College) and Charlotte Beck (Hamilton College)

[253]

Biface Life History and Measurement Efficacy

Elements of technological organization methodology began to coalesce nearly five decades ago. With TO's application to stone tools, lithic analysis moved from an under-appreciated component of archaeological study to one on a par with ceramic and faunal studies. Bill Andrefsky was in the vanguard of archaeologists whose contributions to this methodology brought a fuller understanding of lithic variation as well as improved measurement of that variation. Such progress was possible because of the TO framework focus on process, conceiving it as artifact life history. Thus, lithic tools and by-products of tool production were visualized along sequences or trajectories of material acquisition, manufacture, transport, use, and discard, to borrow from Schiffer's seminal model of the life cycle of durable artifacts. Where a TO focus has been most influential in our research has been with the biface, the dominant class of formal tool in the Western Stemmed tradition of the intermontane region. Here we consider how biface life history is represented by typological and attribute scale measurement, how measurement efficacy is evaluated, and how insights concerning terminal Pleistocene/early Holocene land use derive from analysis of bifacial tool production.

Jones, John [175] see Franklin, Jay

Jones, John [221] see Siegel, Peter

Jones, Kaylee [66] see Hart, Isaac

Jones, KC (University of Georgia), Ashley Smallwood (University of Louisville), Thomas Jennings (University of Louisville) and Jerald Ledbetter (Southeastern Archeological Services Inc.)

[232]

Raw Material Procurement Patterns as Proxy for Evaluating Hunter-Gatherer Mobility in the Paleoindian-to-Early Archaic Transition in Georgia

Major changes in human settlement occurred from the Paleoindian to Early Archaic periods in the Southeast. These include widespread population growth, decreased group mobility, and increased inter- and intra-group interactions resulting in a florescence of distinctive biface stylistic traditions and lithic raw material utilization. We use the Georgia point record in the Paleoindian Database of the Americas (PIDBA) and compare it to diagnostic Early Archaic biface raw material locations generated from cultural resource management (CRM) reports and site locations in Georgia's Natural, Archaeological, and Historic Resources GIS (GNAHRGIS). Combined, these databases include locational and raw material information for over 5,300 diagnostic materials for the periods in question. We then test for evidence of changes in landscape use during the Paleoindian-to-Early Archaic transition. Based on differences in point frequencies, distributions, raw material types, and transport distances, we suggest that significant changes in landscape use and group mobility occurred during this time. These changes correspond, at least in part, to shifting adaptive strategies by hunter-gatherers during this period of marked environmental change, including the utilization of smaller fauna and the emergence of a generalist foraging strategy across the Southeast.

Jones, Lauren, Anna Linderholm (BiG Lab, Texas A&M), Lori Baker (Baylor University, Waco, Texas), Colleen Zori (Baylor University, Waco, Texas) and Davide Zori (Baylor University, Waco, Texas)

[51]

Ancient DNA from Etruscan Tombs and Beyond: Case Study from San Giuliano

The origins of the Etruscans are a heavily debated research question. Modern DNA in conjunction with ancient mitochondrial DNA (mtDNA) has been used to try an answer this problem. Because of the limitations of mtDNA, single genetic marker, no consensus has been reached. It is still debated whether the Etruscans had a local Italian origin (the ancient mtDNA have similarities to modern Tuscan population frequencies) or an ancestry further east in Anatolia. To seek an answer to the question of the Etruscan origins, we have investigated archaeological samples from San Giuliano, a site situated in southern Etruria (northern Lazio, Italy), once the heartland of the Etruscan city-states. This site has been inhabited for millennia, from before the Etruscan civilization emerged until the High Middle Ages when the site was abandoned. Ancient DNA has been extracted from 20 individuals focusing on the Etruscans but also on individuals who lived at the site before and after. Using shotgun sequencing we are looking at questions like the Etruscan origin and kinship among and between the Etruscans and their surroundings both in time and space.

Jones, Lila (Museum of Texas Tech University) and Eileen Johnson (Museum of Texas Tech University)

[165]

Interpreting a Mid-Eighteenth-Century Vertebrate Assemblage from a Probable Comanche site on the Southern High Plains of Texas

Whiskey Flats is a mid-eighteenth-century probable Comanche site on the Southern High Plains in Midland County, Texas. Ongoing excavation in Mustang Draw of the now dry Mustang Pond uncovered evidence of occupation along a terrace and a bone bed within the pond basin. A modern bison periotic from the bone bed dates to the mid-1700s. Artifacts from both areas include lithics, metal, and a glass bead. The collection primarily is composed of a vertebrate assemblage that includes culturally modified modern bison and modern horse, along with remains of local fauna. Attention has been focused on the analysis of faunal remains to create a better understanding of the nature of the deposit and inhabitants of the site. Taxonomic assessment and taphonomy have been used to interpret the assemblage in terms of ecological community and the order of the events that may have taken place during the accumulation of the assemblage. The methods applied have been successful in reconstructing the environmental conditions, butchering process, and aggregation of the assemblage during and after the occupation of the site. The data gathered contribute to the general knowledge of the people and environments of the Southern High Plains and its changes over time.

Jones, Matthew [140] see Maher, Lisa

Jones, Mica [171] see Brandt, Steven

Jones, Richard [196] see Day, Peter

Jones, Travis (University of Georgia, Center for Applied Isotope Studies)

[264]

Navigating New Fields: A Chronology of Coalescent Immigration along the Middle Missouri River

This paper uses Bayesian techniques and radiocarbon data to establish a preliminary chronology for the occupation of the earliest Coalescent villages in the Middle Missouri region of the Northern Plains. Groups referred to collectively as the Coalescent Tradition, likely ancestors of the Arikara, migrated into the southern Middle Missouri Trench (south-central South Dakota) between the fourteenth and fifteenth centuries, AD. Upon arrival, these groups entered into a complex sociopolitical landscape already occupied by village societies identified archaeologically as the Middle Missouri Tradition. Extant architectural and ceramic data suggests this immigration event generated novel fields of social and political interaction between incoming Coalescent groups and established Middle Missouri locals involving both integrative and oppositional practices. However, an understanding of how this process played out on the ground is hindered by poor chronological resolution. In order to understand the tempo and timing of Coalescent arrival(s) and subsequent interactions with Middle Missouri villagers, Bayesian analyses of new and extant radiocarbon dates are used to

create a regional chronology for the establishment of the earliest Coalescent villages. New AMS radiocarbon dates for four Initial Coalescent villages and extant radiocarbon dates from other Coalescent villages are incorporated into this new settlement chronology.

Jöns, Hauke [238] see Segschneider, Martin

Jonsson, Maria [214] see Brown, Erin

Joplin, Jerry [147] see Schwindt, Dylan

Jordan, Jillian [168] see Awe, Jaime

Jorgensen, Alex [124] see Ladefoged, Thegn

Jorgenson, Matthew [55] see Harris, Matthew

Jorgeson, Ian (Southern Methodist University), Ryan Breslawski (Southern Methodist University) and Matthew Boulanger (Southern Methodist University)

[55]

A Bayesian Model for Dating Pipestems

English pipestem diameters decreased regularly over time and are thus a potentially useful metric for dating historic sites in eastern North America. Binford quantified this relationship with a linear regression model, but his approach reduced pipestem diameters to a single mean value, predicted a mean date of occupation, rather than a likely range of occupation, and failed to acknowledge that the relationship between pipestem diameter and time is not strictly linear. Pipestem data also have measurement error issues: diameters are recorded as discrete rather than continuous values, and "known date" pipestem ages are ranges as large as over 100 years. To resolve these issues, we fit a Bayesian measurement-error model to over 90,000 pipestems from well-dated contexts. Bayesian inference provides conservative parameter estimates for the modeled age-diameter relationship, and the fitted model allows us to forecast the full distribution of likely dates given known stem-diameters. Thus, a Bayesian approach provides a more realistic and informative estimate of site occupation; importantly, it provides a probabilistic estimate of the likelihood that a site was occupied over a range of dates and quantifies the uncertainty of those estimates. We apply this model to estimate likely date distributions for previously poorly-dated historic sites.

Jorissen, Philippa (University of Oregon), Traci Ardren (University of Miami), Michelle LeFebvre (Florida Museum of Natural History), Victor Thompson (University of Georgia) and Scott Fitzpatrick (University of Oregon)

[59]

Resilience and Paleo-Climate Proxies in the Prehistoric Florida Keys

The Florida Keys are among the most vulnerable coastal locations to the effects of climate change in the continental United States. Home to almost 100,000 people and composed of over 1,700 low-lying islands arcing west from the southern tip of peninsular Florida, the "Keys" are surrounded by the world's third largest coral reef tract and are one of 15 national marine sanctuaries in North America. The Keys also have an array of upland and coastal environments that are home to several vulnerable habitats and animals. Global sea level changes and regional storm events are among the most pervasive climate-induced threats to the region, with variable impacts across local marine and terrestrial ecosystems, and the people dependent on them. Here we discuss the Matecumbe Chiefdom Project and its focus on elucidating cultural and historical ecological relationships spanning the Keys and southern peninsular Florida. Drawing on recent GIS modeling of Glades Period (1000 BC–AD 1700) settlement patterns, historical reviews of freshwater availability, and ongoing zooarchaeological analyses, we demonstrate the critical need for archaeologically derived paleo-climate proxies and argue for the concerted integration of archaeological data within transdisciplinary climate reconstructions and models of local scale human and biodiversity resilience in the region.

Joseph, J. (New South Associates)

[58]

Discussant

Joseph, J. (New South Associates), Andrea Farmer (USACE St. Louis), Andrea Gregory (USACE St. Louis), Alaina Harmon (USACE St. Louis) and Jasmine Heckman (New South Associates)

[132]

From Mass Graves to New Lives: The Veterans Curation Program

Dr. Michael "Sonny" Trimble's experience on the excavation of Saddam Hussein's mass burial sites in Iraq exposed him to the challenges the U.S. military faced in the Iraq conflict and heightened his appreciation for the women and men of our armed forces. Returning to his role as Director of the U.S. Army Corps of Engineers' Mandatory Center of Expertise for the Curation and Management of Archaeological Collections, "Sonny", saw the opportunity to repay our military service members by seeking American Recovery and Reinvestment Act funding to establish a program that would employ veterans in the rehabilitation of

archaeological collections. Now in its tenth year of operation, this paper reviews the operations of the Veterans Curation Program (VCP) and the benefits it brings to both military veterans and our archaeological heritage.

[132]

Chair

Joy, Shawn (Florida State University)

[18]

Coastally Adapted: A Model for Eastern Coastal Paleoindian Sites

Predicting the cultural material typology of Gulf of Mexico coastal Paleoindians is a challenge due to sea-level rise since the LGM. In the Americas, archaeologists have identified only a handful of unequivocal coastal Paleoindian sites. The location of these sites are on the west coast of the Americas, where the sea-level rise was less invasive due to the steep coastal topography. However, not a single unequivocal coastal Paleoindian site has been identified on the Eastern continental shelf. This research investigates Pleistocene hunter-gatherer sites with coastal materials from regions around the world. These regions contain evidence of marine subsistence patterns spanning 150,000 years in settings similar in climate, submerged coastal plain profile, and subsistence resources along the Gulf of Mexico. I present here a model utilizing these data and anthropological uniformitarianism of subsistence patterns, coastal mobility ranges, and lithic tool technology through time as the proximity to the sea changed due to fluctuating sea-levels.

[18]

Chair

Joy, Shawn [18] see Smith, Morgan

Joyce, Arthur (University of Colorado at Boulder), Sarah Barber (University of Central Florida), Guy Hepp (California State University, San Bernardino), Jacklyn Rumberger (Washington State University) and Mathew Sponheimer (University of Colorado Boulder)

[189]

Isotopic Evidence for Human Dietary Change in the Lower Rio Verde Valley of Oaxaca from the Formative to the Postclassic Period

This paper presents the results of an isotopic study of human dietary change in the lower Rio Verde Valley, Oaxaca, Mexico. Stable isotope analysis was carried out on a total of 122 individuals from Early Formative to Early Postclassic (3900–740 cal BP) burials. $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values were determined for collagen in human and animal dentine from archaeological excavations, while $\delta^{13}\text{C}$ values were determined for enamel apatite in teeth, primarily third molars. Modern plants, as well as bone and hair from living animals, were also sampled to provide additional contextual data. Enamel $\delta^{13}\text{C}$ values are consistent with increased consumption of C_4 plants from the Early Formative to the Early Postclassic period. The greatest increase in $\delta^{13}\text{C}$ occurs from the Late Formative to the Terminal Formative, or between 150 BC and AD 100. Moreover, Ba/Sr ratios from an earlier study and collagen $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ from a subset of the samples are not consistent with the significant exploitation of marine foods. The dietary evidence is consistent with the results of paleoenvironmental research indicating an expansion of the lower Verde's fertile floodplain during the Formative period resulting in an increased emphasis on maize agriculture by people in the region.

Joyce, Kaley [236] see James, L. Brock

Joyce, Kaley [235] see Louderback, Lisbeth

Juarez, Santiago (Colgate University)

[189]

Cosmology at Home: Centering Rituals within the Residences of Late Preclassic Noh K'uh, Chiapas, Mexico

The Late Preclassic (400 BC–AD 200) site of Noh K'uh is located in the Mensabäk basin, 30 km west of the Usumacinta River. Noh K'uh was a small ceremonial center composed of several residential groups centered around a ceremonial plaza. Noh K'uh's location near the western edge of the Maya lowlands placed residents near contemporary civilizations in the Isthmian sphere and the highlands of Chiapas. Preliminary data from the excavations demonstrates household ceremonial materials and practices that may have been influenced by multiple contemporary civilizations. This research reveals how the people of Noh K'uh integrated cosmological beliefs and practices within their domestic routines.

Judkins, Abigail (University of New Mexico)

[71]

The Persistence of Traditional Hunting Strategies in Northern Alaska

Northern Alaska (here defined as the North Slope Borough) was not visited by Europeans and European-Americans until much later in history, despite the presence of Russian fur traders in the southern region of Alaska in the eighteenth and nineteenth centuries. However, the presence of fur traders and other colonists to the south may possibly have influenced Northern Alaskan lifeways relatively early on. How did traditional Arctic hunting methods change, if at all, in the early historic period in this far northern region? Previous accounts (Murdoch 1892) suggest that the patterns seen in the Thule tradition persisted into contemporary times, with maintenance of a traditional seasonal round in the Point Barrow region into the late nineteenth century. In this paper, I use results from my study of the historic zooarchaeological assemblage from the Walakpa site in northern Alaska to evaluate these questions. I consider the taxonomic frequency and culinary processing patterns to examine how the harsh climate in this region affected foraging strategies and archaeological bone preservation. Finally, I compare these data to those from the late Thule period to examine the persistence of traditional foraging strategies into the historic period.

Junco, Roberto [18] see Horrell, Christopher

Junge, Justin (National Park Service), Andrew Tremayne (Forest Service) and Thomas Urban (Cornell)

[64]

Home Is Where the Hearth Is: Re-assessing Occupation Histories of the Earliest Use of the Beach Ridges at Cape Krusenstern National Monument

The beach ridges at Cape Krusenstern holds a unique place in Alaskan Archaeology with a long history of research and excavation to understand the 5,000 year history of the area. Building off work from the 1960s until the early 2010s, surveys during the summers of 2017 and 2018 with the use of geophysical surveying provides exceptional understanding of features and chronologies on the earliest beach ridges. Based on magnetometer research and testing, we explore the accuracy of methods in finding buried intact hearths, compare the precision of the legacy data with discovered features, and discuss the findings of recent research.

Junker, Laura [188] see Monaghan, John

Juptner, Derick and Jordan Pratt (Texas A&M University)

[75]

Insights from the Faunal Distribution at the Weed Lake Ditch site (35HA341) in Southeastern Oregon

Weed Lake Ditch is an open air site located on the shores of Pluvial Lake Malheur in the Harney Basin of southeastern Oregon. Excavations by the University of Nevada, Reno and the Center for the Study of the First Americans have revealed multiple stemmed points and crescent lithic technology in buried contexts. Faunal remains from the site were numerous but heavily fragmented in nature and in medium to poor condition. Distribution of the bone was not even throughout the site and was concentrated heavily in turbated soils about 20 cm below the surface in a layer that is associated with a pronounced cultural layer of lithic artifacts. Here we analyze the fragmented faunal remains following Stiner and Kuhn (1995), to assess the degree they may have been altered by fire. Additionally, we assess the faunal distribution, and how it is correlated with the lithic assemblage, as well as stress the effectiveness of our excavation methods for recovering more of the overall faunal materials.

Jurado, Erik, Mario Córdova Tello (CINAH Morelos), Carolina Meza Rodriguez (CINAH Morelos) and Gerardo Gutierrez (University of Colorado Boulder)

[150]

Recent Research at San Ignacio, Morelos: A Regional Center in the Teotihuacan Hinterland

San Ignacio is located in the Amatzinac valley of Morelos approximately 10 km south of the Formative center of Chalcatzingo. San Ignacio was the largest center in eastern Morelos during the Classic period. Previous research has suggested that during its apogee, San Ignacio may have functioned as a Teotihuacan administrative center. The Proyecto Arqueológico Mapeo y Prospección de San Ignacio (PAMPSI) was launched over the summer of 2019 to investigate this hypothesis. Fieldwork included mapping, surface collections, test excavations, and ceramic analysis. This poster presents preliminary findings regarding the site's occupation, stratigraphy, and internal organization. Directions for continued research of the site and its relationship to Teotihuacan are proposed. The study of San Ignacio is key for improving our understanding of the Classic period in Morelos as well as Classic period societies outside of the Basin of Mexico.

Jurgens, Christopher [68] see Koenig, Charles

Kabata, Shigeru [128] see Murakami, Tatsuya

Kaeding, Adam and Eleanor Harrison-Buck (University of New Hampshire)

[14]

The Maya at Spanish Contact in the Lower Belize River Watershed

Throughout the colonial period the Mérida-based Spanish administration organized and launched multiple entradas headed south into the Petén. These entradas ranged from relatively small groups of religious missionaries and their envoys, to private armies funded by opportunists seeking a reward of prestige and political power. The goals of these advances included the conversion of Maya people living as non-Christians in the areas beyond the reach of the colonial church network, toppling what has been deemed the "Last Maya Kingdom," capturing Maya laborers who had fled their colonial circumstances, and securing the untamed area beyond the southern border of administrative control. For over a century, these largely unsuccessful entrada efforts left their mark on the historical and archaeological record. Many of these journeys traversed the survey area of the Belize River East Archaeological Project (BREA). This paper presents the results of the ongoing BREA efforts to gather the documentary and archaeological evidence for these earliest European incursions into this portion of Belize and characterize the landscapes and communities they encountered.

Kaeding, Adam [14] see Murata, Satoru

Kahn, Jennifer (The College of William and Mary)

[88]

Discussant

Kaki, Moureen [179] see Hard, Robert

Kamenov, George [159] see Briggs, Emily
 Kamenov, George [240] see Fry, Megan
 Kamenov, George [80] see Williamson, Kylie

Kamph, Molly [185] see Hill, Catherine

Kamp-Whittaker, April (Arizona State University)

[29]

Are Communal Facilities Indicators of Neighborhoods? Applying Network Data to a WWII Japanese American Incarceration Center
 Socially defined neighborhoods develop through frequent face to face interactions among residents and their self-identification as neighbors. In contrast, archaeological identification of neighborhoods is dependent on artifact frequencies, boundaries, or shared features. There is an implicit assumption that the presence of communal facilities or features can act as indicators of social interaction. But how effectively do the prevalence of these features correspond to levels of personal interactions among neighborhood residents? Network data drawn from historic newspapers published by internees at Amache, a WWII Japanese American Incarceration Center is used to create networks of interaction between residents of a block, generally viewed as a neighborhood. Within a sample of residential areas these interpersonal networks are compared to the frequency of community landscape features to see how well archaeological remains correspond to network data in identifying socially defined neighborhoods archaeologically.

[29]

Chair

Kanezaki, Yuko (Graduate School of Humanities and Sociology, University of Tokyo), Takayuki Omori (University Museum, University of Tokyo) and Eisei Tsurumi (University Museum, University of Tokyo)

[182]

Early Pottery Development in a Frontier: A New Chronology of Wairajirca Pottery from the Huánuco Region, Peru
 We present a high-resolution chronology of Wairajirca pottery in the Early Formative period, one of the earliest pottery traditions in the Central Andes, which developed in a region between the Andean Highlands and the Amazonian rainforests. Fine-grained pottery and radiocarbon analysis at the Jancao site in the Huánuco region revealed a five-staged ceramic sequence from the mid-eighteenth to the late eleventh century cal BC. The ceramic sequence demonstrated that Wairajirca pottery developed rather radically, featuring a diversification of vessel forms, the occurrence of two distinctive styles within an assemblage, and technological innovations. Various elements of the pottery traditions of the highlands and the lowlands had been introduced selectively in different periods, alongside continuing local traditions. All these features strongly suggest that this development occurred in situ rather than through simple diffusion from other regions, stimulated by the fluid interaction among different ecological zones in the second millennium BC. That is, the sociopolitical movements in the Huánuco region as a frontier had a close relationship with the development of Wairajirca pottery, indicating that frontier dynamics played an important role in the social process of the emergence and development of pottery in the Central Andes.

Kangas, Rachael [146] see Miller, Sarah

Kansa, Eric [183] see Wells, Joshua

Kanungo, Alok [249] see Abraham, Shinu
 Kanungo, Alok [249] see Fenn, Thomas

Kaplan, Emily

[258]

Chair

Kaplan, Emily [258] see Katz, Monica

Kappelman, John (University of Texas, Austin), Lindsey Trombetta (Austin Community College), Laure Dussubieux (Field Museum), Agazi Negash (Addis Ababa University) and Lawrence Todd (University of Texas, Austin)

[249]

Beads and Burials in the Lowlands of Northwestern Ethiopia

The lowlands of northwestern Ethiopia are inhabited by horticulturalists who occasionally practice seasonal fishing and hunting. In 2018 archaeological survey located site GQ165 with an abundant and diverse surface assemblage of ceramics, chipped and ground stone, and faunal remains. The site also includes two human burials, an adult and young adult based on dental eruption and wear. AMS 14C dating of a tooth from each burial yielded a mean age of 1344 cal AD. The burials include glass and stone beads and a single ostrich eggshell bead. A total of 17 glass beads were analyzed by ICP-MS at the Field Museum of Natural History. The beads

are uniform in composition. Their relatively high concentrations of magnesia, potash, and alumina place them in the high alumina soda plant ash (v-Na-Al) glass group, and their lower zirconium concentrations fall within the range of Mapungubwe oblate (MO) v-Na-Al glass known from southern African sites of similar age. Although iron implements have not been found, the documented assemblage of artifacts suggests the presence of a horticultural group using a combination of chipped and ground stone and pottery. The absence of variety in the bead types suggests limited inter-regional trade connections.

Karastamatis, Kallista, Ashley McKeown (Texas State University, San Marcos) and Courtney Siegert (Texas State University)

[215]

The Down and Dirty: Differential Preservation of Burials from Eighteenth- and Nineteenth-Century Cemeteries on Sint Eustatius, Dutch Caribbean

This study explores the markedly different preservation of skeletal remains from two historic cemeteries situated within 500 m of each other on the Dutch Caribbean island of Sint Eustatius. The burials of eighteenth-century enslaved Africans are located along the coast and are eroding onto the beach below. The nineteenth-century graveyard was associated with a nearby leper colony, known as the Lazaretto, and despite being nearly a century younger, the skeletal remains are in far worse condition. Qualitative and quantitative analysis of the differential preservation present in the cranial elements and long bones was performed, and ArcGIS was used to visually depict the taphonomic differences between the two sites. Several variables were evaluated, including grave depth, soil attributes, and funerary practices to explain the variation observed.

Karbula, James (Quanta Environmental Solutions Inc.)

[55]

A Critical Reevaluation of Radiocarbon Ages from the Berdoll Site (41TV2125), in Support of Refined Site Spatial and Contextual Analyses

The Berdoll site (41TV2125) is a deeply buried early Archaic campsite in the floodplain of Onion Creek in Travis County, Texas. The site presents direct evidence of plant food processing at approximately 7606–8291 BP (conventional). Seventeen charred botanical remains including onion bulbs from earth ovens were submitted to two different radiocarbon labs for analysis. Considered critically, six burned rock features utilized on a temporarily stable terrace landform were assigned a temporal span of approximately 367–years from 7736–8103 BP. Using modern Bayesian statistical techniques, recalibrations and calendar conversions in OxCal 4.3 (IntCal 13), these radiocarbon ages are reexamined for accuracy, and then utilized as another line of archaeological evidence to determine the sequence of, to separate out, and to narrow the age ranges of the occupations at the site. Updated calibrations and conversion to calendar ages suggests two primary periods of site use from ca. 6600–6800, and 7000–7150 BC. At least one “single-use” event is identified from 6600–6800 BC. These studies demonstrate how the use of Bayesian inference can narrow the range of site radiocarbon ages, assist in the vertical and horizontal spatial and contextual analyses of archaeological features, occupations and components, and provide correlations to known events in history.

Kardamaki, Elina [196] see Tsai, Che-hsien

Kardulias, Paul Nick (College of Wooster), Konstantinos Trimmis (University of Bristol), Stavros Paspalas (University of Sydney), Lita Tzortzopoulou-Gregory (The Australian Archaeological Institute at Athens) and Timothy Gregory (The Ohio State University)

[36]

Quartz Artifacts from Kythera, Greece, and Human Migration in the Aegean during the Paleolithic

While long-term permanent occupation on Mediterranean islands did not occur until the Neolithic, a growing body of evidence over the past decade demonstrates human presence in the preceding Paleolithic and Mesolithic. In the Aegean region, the discovery of Acheulian style stone tools on Crete spurred investigations that identified Paleolithic remains on a number of other islands, including Naxos, Zakynthos, Kephallonia, and Lesbos. This material has raised questions about the nature of hominin dispersal into the Mediterranean and Europe. One way to think about this spread is by means of “bridge” islands that lie close to continental shores, to which Paleolithic people would have ventured first, followed by excursions to more isolated pelagic locations. Over the past three years, survey on Kythera, lying just south of the Peloponnesos, has recovered an assemblage of quartz artifacts from the Koupharika-Krotiria site with similarities to material found in Paleolithic contexts on other islands. A cleaver and scraper bear a strong resemblance to quartz tools from Plakias in southwestern Crete that have been dated to the late Lower Paleolithic. These recent discoveries by the Australian Paliochora-Kythera Archaeological Survey add to the list another location that may have been visited by humans in the Pleistocene.

Karkanias, Panagiotis (Takis) [195] see Holcomb, Justin

Karle, Martina [107] see Wolters, Steffen

Karsten, Jordan [244] see Blohm, Tre

Karthauser, Chelsea [5] see Martin, Erik

Karty, Jonathan [169] see Newell, Savannah

Kassabaum, Megan (University of Pennsylvania), Arielle Pierson (University of Pennsylvania) and Erin Spicola (University of Pennsylvania)

[254]

Connecting Past and Present Landscapes through Museum Education and Public Archaeology

Native American mound sites and their inhabitants are often misunderstood by local communities and are severely underrepresented in educational curricula despite being a primary research focus for North American archaeologists. These monuments stand as testament to the creativity and skill of their builders and provide important, material touchstones between modern populations and the ancient past, yet they are rapidly disappearing due to erosion, farming, development, and looting. Education aimed at populations who interact with mound sites as part of their quotidian landscape is key to their protection and to engendering respect for past and present Native communities. During Summer 2019, in pursuit of this goal, we opened an exhibit focusing on Native American moundbuilders in the Wilkinson County Museum in rural southwestern Mississippi. The exhibit's goal is to connect visitors with the past inhabitants of their land by emphasizing how a shared landscape has led to similar lifeways through time (e.g., hunting, fishing, and cooking similar game, use of familiar natural resources, and construction of communal and ritual structures). This paper will describe the methods we used to achieve this goal and evaluate its effectiveness as well as discussing future steps necessary to expand its impact.

Kassabaum, Megan [222] see Graham, Anna

Kataoka, Osamu [100] see Ono, Rintaro

Kate, Emily (Pennsylvania State University), J. Heath Anderson (Minnesota State University, Mankato), Douglas Kennett (University of California, Santa Barbara) and John Krigbaum (University of Florida, Gainesville)

[150]

A Study of Epiclassic Human Mobility at Hilltop Settlements in Hidalgo, Mexico, Using Stable and Radiometric Isotope Analyses and Radiocarbon Dating

We present preliminary mobility data for individuals recovered from the Epiclassic hilltop settlements of Cerro Magoni, La Mesa, Pahnú, Huesamenta, and El Zethe. For decades it has been hypothesized that the Tula region of Hidalgo and surrounding areas 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 toward testing the long-held migration hypothesis. Analyses of environmental materials were conducted to establish local baselines for oxygen ($\delta^{18}\text{O}$) and radiometric strontium ($87\text{Sr}/86\text{Sr}$) and lead ($20\text{nPb}/204\text{Pb}$) ratios for the study regions. These baseline values were then compared to human $\delta^{18}\text{O}$, $87\text{Sr}/86\text{Sr}$, and $20\text{nPb}/204\text{Pb}$ values, derived from the analysis of tooth enamel, to identify individuals who may have migrated to the study sites during the Epiclassic. For all individuals included in this study, bioarchaeological, mortuary, AMS radiocarbon and stable carbon ($\delta^{13}\text{C}$) and nitrogen ($\delta^{15}\text{N}$) data are also assayed to contextualize the migration data. These new mobility data, in conjunction with other bioarchaeological results, will provide further insight into the population patterns of the pre-Toltec Hidalgo especially when compared with data from other Epiclassic sites.

Katz, Jared (Denver Art Museum)

[25]

Ancient Maya Soundscapes: How Music Impacts People's Experiences

From the cacophonous noise of wooden cart wheels on ancient Roman roads to the thunderous sound of trumpets, drums, and shouting emanating from ancient Maya ball courts, sound had a direct and significant impact on the lives of ancient people around the world. This talk will discuss the various genres of music used in the ancient Maya area and the resulting soundscapes that were created. The musical instruments found archaeologically, with few exceptions, are not depicted in artistic renderings of musical groups. This demonstrates that the instruments used in a household context were very different than the instruments played in large ceremonial contexts, and for good reason. To have the Bonampak band playing in an ancient Maya household courtyard would be like bringing a marching band to a cookout. The instruments selected needed to be appropriate for the space and scale of the event. This talk will rely on phenomenological theory, musical artifacts, and depictions of musical groups to shed light on how music was intentionally used to shape peoples experiences and the manner in which events were perceived.

Katz, Monica (Hispanic Society of America), Emily Kaplan (National Museum of the American Indian) and Catalina Ospina (Dept. of Art History University of Chicago)

[258]

Unresolved Questions in the Study of Mopa-mopa: History, Geography, and Chemistry

Mopa-mopa is the collective name given to the resin from a species of the plant genus *Elaeagia* (family Rubiaceae) that grows in regions of Peru, Ecuador and Colombia. The resin has been used from prehispanic times to the present day to decorate a range of objects from colonial Inka qeros to highly-decorated and prized luxury colonial wooden objects such as chests and writing desks represented in museum collections around the world. The resin is used today by master artisans in Pasto, Colombia, for a folkart style called barniz de pasto. The study of mopa-mopa is beset with apparent contradictions due to the scant archaeological record, inconsistently interpreted historical accounts and limited ethnohistorical and art historical research. Challenges for experimental archaeology and the study of the chemistry of the resin have included the difficulty of obtaining botanical reference standards with which to compare samples from collections objects, and the relatively rare nature of the plant source and limited geographic access to raw material. Here we review original source material, attempt a timeline, and consolidate the current information on botanical

dispersion of the plants and published chemical analyses to provide a road-map for future study

Kaufman, Brett [240] see Edington, Stacy

Kaul, Urvi, Paloma Cuello de Pozo and Jose Peña
[240]

Lab Methodologies for Looted Mortuary Sites

Looted archaeological sites hinder proper analysis due to destruction of in situ contextualized information limiting the type of data retrieved. Historically, looting includes archaeologists hoping to build either museum or private collections. The discipline has been evolving through the refinement of field methodologies and the adoption of interdisciplinary practices. Today, archaeologists often work in tandem with the local population and institutions to restore their history and give back to the community. In this project we focus on difficulties that arise when developing lab methodologies for cataloging looted mortuary sites. At the El Campanario Project, in Huarmey, Peru, all interments had been removed from their original context due to looting practices (huaqueos). Remains were strewn across the superior and surface layers causing irreparable damage from sun-bleaching and other surface agents. Here we focus on exploring a lab methodology that operates within the confines of our resources, time, and materials. The difficulties of examining looted archaeological material arise from the lack of standardized cataloguing techniques, therefore our attempts have followed a trial and error process. We have designed several methods for cataloging and comparing the remains, and determined the need for a standard lab technique to properly study looted mortuary sites.

Kavich, Gwenaelle [180] see Gingerich, Joseph A. M.

Kay, Marvin (University of Arkansas)
[69]

Dalton Point Engineering Design

For more than a thousand years lanceolate Dalton points increasingly favored greater blade element length while sacrificing haft length. Even so, tool function did not change. The Breckenridge Dalton, at the end of this sequence, developed a novel, notched hafting approach and dramatically reduced haft lengths.

Kealhofer, Lisa [168] see Stark, Miriam

Keef, Sean [66] see Thompsett, Neil

Keenan, Benjamin [128] see Douglas, Peter

Keene, Joshua (Baylor University)
[19]

Archaeological Surface Survey of the Hall's Cave Site (41KR474): Preliminary Results

The Hall's Cave site, located in Kerr county, TX, was initially identified as a paleontological site. However, later investigations identified the presence of stone tools and other lithic debris in and around the cave entrance. Hall's Cave (originally Klein Cave) was officially recorded as an archaeological site in the 1990s, with an initial assessment identifying a dense lithic concentration over 200 m wide surrounding the entrance. However, at that time, little was done to map and characterize the extent or composition of this surface assemblage. In addition to archaeological excavations of sediments within the cave in 2017–2018, a survey and surface mapping project was conducted in the summer of 2019 to provide high-resolution GPS data of all prehistoric artifacts located on the ground surface outside of the cave, with the goal of identifying discrete activity areas with associated time-diagnostic projectile points. With this information, it is possible to compare the rough chronology of site use and human subsistence outside of the cave with evidence found in stratified contexts within, providing a more complete, comprehensive picture of site use and diachronic subsistence change at Hall's Cave throughout the terminal Pleistocene and Holocene.

[19]

Chair

Keene, Joshua [19] see Laughlin, Tyler

Kehoe, Alice
[31]

Moderator

Kehoe, Alice
[103]

Ruthann, the Leader-Hearted Woman—Inawa'sioskitsipaki

The Blackfoot, in whose territories Ruthann Knudson worked, recognize some women as inawa'sioskitsipaki, a "leader-hearted woman." Such a woman is strong, intelligent, highly moral, outstandingly capable in the tasks she carries out, kind, and generous.

She is deeply respected, and listened to. Oscar Lewis, in a classic paper, introduced the phrase but translated it as “manly-hearted woman.” Contemporary Blackfoot speakers say “leader-hearted” is closer to its meaning. Ruthann didn’t act macho; she was calm, steady, collegial, and clear-headed on what good science required. Wherever she worked, she was the leader people needed. This presentation will highlight some of her fearless empiricism, breaking out of boxes, the power of an inawa’sioskitsipaki.

Keller, Chad [186] see Harris, Brendan

Keller, Hannah (Yale University), Fabio Negrino (University of Genoa), Naomi Cleghorn (University of Texas, Arlington) and Jamie Hodgkins (University of Colorado, Denver)

[38]

A Taphonomic Comparison of Two Late Pleistocene Zooarchaeological Assemblages in Northwest Italy and the Western Cape of South Africa

A driving question in paleoanthropology is the extent of behavioral divergence in hominin species, particularly Anatomically Modern Homo sapiens (AMH) and Neanderthals. Generally, direct comparisons are restricted to Europe, where both hominin species were interacting within the same environmental constraints. However, obtaining species-level site use patterns should also consider non-European groups of AMH for comparison with Neanderthals. Coastal South Africa offers an optimal record for such a comparison—a human population that was likely among the most distantly related to contemporary AMH in Europe. This study compares the faunal taphonomy of two late Pleistocene cave sites: the Mousterian deposits at Arma Veirana (AV) in northwestern Italy ($\geq 45,000$ BP) and Knysna Eastern Heads Cave 1 (KEH-1) in coastal South Africa (46,000 BP–19,000 BP). Both sites are located in temperate zones. Our goal is to understand how the different geological contexts of these two caves will impact faunal taphonomy, particularly bone surface visibility, and thus comparisons of behavior. Approximately 900 (AV) and 500 (KEH-1) faunal specimens from both assemblages were analyzed using standardized zooarchaeological methodologies. We assessed extent and frequency of acid destruction and fragmentation. Subsequent studies will compare anthropogenic taphonomy between the sites to identify potential species-wide behavioral divergences.

[38]

Chair

Kellett, Lucas (University of Maine, Farmington)

[224]

A Preliminary Look at Inka Imperialism on the Eastern Frontier of Paucartambo, Peru

This paper offers a preliminary look at the Inka occupation of the Paucartambo area, located at the eastern edge of the greater Cusco highland region. Recent reconnaissance work in the region confirms a strong Inka presence in the Quencomayo and Paucartambo River valleys. Previous and current work confirm the presence of numerous Inka roads entering the valley from all directions reflecting the importance of the region for the movement of goods, especially coca, from the eastern ceja de selva. The presence of large, fortified hilltop sites, as well as corral and chullpa complexes in the upper suni and puna zones suggests a sizeable Late Intermediate Period (~1000–1400 CE) population in the region before Inka incursion. A series of Inka fortresses (e.g., Watoqto, Inka Raqay) and tambos in the valley indicate the high imperial investment in the region and the subjugation and resettlement of local populations during the Late Horizon (~1400–1532 CE). In sum, Paucartambo was a strategically and economically valuable region of the eastern quarter of Antisuyu, and holds high potential for continued interdisciplinary research.

Kelley, Alice, Arthur Spiess (Maine Historic Preservation Commission) and Bonnie Newsom (University of Maine)

[9]

Maine Midden Minders: Citizen Science and Coastal Erosion

As climate change impacts the coast, the sheer numbers of affected archaeological sites are staggering. Maine’s coastline hosts over 2000 recorded shell middens, as well as additional pre-European and historic sites. Virtually all are being eroded by climate change related sea level rise and shifting weather conditions. In the case of shell middens, professional evaluation and monitoring of each location is impossible with current resources. The Maine Midden Minders project is working closely with the Maine Historic Preservation Commission to provide a stronger basis for shell midden cultural management decisions by creating a database of citizen science generated data that documents site degradation and erosion rates, in addition to existing SHPO site significance data. The program is organized through conservation organizations and a website, and welcomes local and tribal community member participation. This collaboration has required some revised procedures for using archaeological data, such as limited sharing of site locations and the creation of a specially designed database to shield site locations from the general public. Volunteer involvement provides opportunities for public education, appreciation of the threatened nature of these sites, and local advocates for cultural heritage preservation.

Kelley, Alice

[220]

Discussant

Kellner, Corina [21] see Conlee, Christina

Kellner, Corina [184] see Ekdahl, Amanda

Kelly, Dylan [33] see Howey, Meghan

Kelly, John (Washington University)**[166]***The Square within the Circle: Plazas as Stages of Symbolic Performance at Cahokia and Environs*

My first encounter with Kent Reilly was at the SAAs in Nashville in April 1997. Kent was the senior author on a paper with James Garber, "Unlocking the Iconographic Systems of the Mississippian Period Southeast: The Origins and Purpose of the Southeastern Ceremonial Complex (SECC) Working Group." I don't recall any of the details of their paper, however, I do vividly remember Kent suddenly flowing in a choreographic manner about the stage. I assume his performance was all in reference to the symbolism portrayed in the indigenous dances so eloquently captured in some of the artwork of the ancient Mississippians. One of my primary interests is the manner in which the plans of native settlements are cosmograms embedded with numerous symbols and symbolic messages similar to those portrayed in the portable and non portable corpus of what we call art. This presentation reflects back on Kent's dance and the plazas within these ancient cosmograms where dance activity occurs and the manner in which these places embody many symbolic elements of the SECC especially the basic building blocks of the square and circle.

Kelly, John**[218]***Discussant***Kelly, John (Public Archaeology Laboratory Inc.) and Daniel Forrest (Public Archaeology Laboratory Inc.)****[232]**

Between the Shores and the Hills: Precontact Boundaries and Behavior along the Housatonic River in Southwestern Connecticut
Archaeological investigations by the Public Archaeological Laboratory along a natural gas pipeline right-of-way in southwestern Connecticut have identified a cluster of pre-contact Native American sites in Newtown, situated along Rodericks Brook, a tributary stream to the Housatonic River. The sites include the Canopy Site (97-101), the Alberts Hill Road Site (97-102), and the McLaughlin Vineyard Site (97-106). Rodericks Brook runs along a previously documented lithic watershed and inferred territorial boundary separating the coastal pre-contact peoples of the lower Housatonic drainage from the interior-oriented groups of the upper river drainage. While the assemblages from these sites contain stone raw materials typical of sites from similar periods in the Lower Housatonic Valley, the large volume of burned and heat-treated vein quartz and the caching of bifacial cores is unusual and appears to be unique to the Rodericks Brook drainage. The authors propose that the unusual assemblages may be associated with boundary maintenance between distinct Archaic populations along a shared frontier.

Kelly, John [56] see Goldstein, Lynne

Kelly, Kenneth [239] see Wallman, Diane

Kelly, Mary Kate [223] see Freidel, David

Kelly, Nigel (Bruker Nano Analytics), John Patterson (Bruker Nano Analytics), Robert Shannon (Bruker Nano Analytics) and Lee Drake (Decision Tree LLC)**[203]***Is It Time for an Open Discussion about Calibrations in Portable XRF Analysis?*

The introduction of handheld X-ray Fluorescence (pXRF) instruments, and the proliferation in their use due to both financial accessibility and field portability, has significantly influenced archaeological science. However, individual user understanding of pXRF application, including the function of calibrations (as factory installed or user defined), has not kept pace with the uptake of the technique. This paper will discuss the fundamentals of pXRF calibrations, differences between factory and type calibrations, and the limitations of each approach. Included will be the importance of sample type, sample preparation, and their effect on the calibration, which is misunderstood in some published literature. Building on an existing and extensive body of work by community leaders in archaeological science, we will also present a framework for best practice in common areas of pXRF analysis in the field or the lab to serve as a discussion for community-wide methodological standards.

Kelly, Robert [26] see Robinson, Erick

Kelso, William [173] see Owsley, Douglas

Kemp, Brian [129] see Conrad, Cyler

Kendall, Bryan (University of Iowa Office of the State Archaeologist) and William Whittaker (University of Iowa Office of the State Archaeologist)**[8]***Relocation and 3D mapping of the Amana Fish Weir 13IW100*

The Amana Fish Weir is one of the most well documented Native American fishing structures in the Midwest. The V-shaped stone

weir was visible in the bed of the Iowa River during periods of drought since at least 1844. Due to a northward migration of the river, no portion of the structure has been observed since the fall of 1999. A 2017 investigation of the site location has resulted in relocation and 3D mapping of weir, now preserved intact below about 2.5 m of silt and sand.

Kendall, Bryan [78] see Waterman, Anna

Kendall, Iain [61] see Miller, Melanie

Kennedy, J Ryan (University of New Orleans) and Christopher Grant (University of Chicago)
[129]

"Spoils of the forest": Toward an Archaeology of Birds, Millinery, and Fashion

Bird feathers have long been used as decorations on clothing, hats, and the human body. The varied colors and shapes of feathers make them attractive and sought-after objects, and the efforts required to obtain them can transform feathers into luxury items. This was particularly the case in the late nineteenth century, when bird feathers, and even whole birds, became such common decorations on ladies' hats and other accessories that some bird populations crashed or were even driven to extinction. Our paper examines the use of bird feathers in eighteenth- and nineteenth-century millinery and fashion. We weave together historical accounts of the collection and trade of bird feathers with zooarchaeological data from two archaeological sites: (1) an eighteenth-century plantation in New Orleans, Louisiana, and (2) a nineteenth-century mill site in Indiana. We document the capture of a variety of wild birds whose feathers were used as decorations, and we discuss the roles that feathers played in these contexts including underpinning local fashion trends and labor formation and contributing to global flows of animal products. Ultimately, we argue that the use of feathers in fashion constitutes an important non-culinary aspect of human-bird relationships that remains critically understudied in historical contexts.

Kennedy, Jaime [195] see McDonough, Katelyn

Kennedy, Jason (Central Michigan University)
[86]

Work Is the Curse of the Drinking Class: Beer, Labor, and Class in the Ancient Near East

The archaeology of beer has received significant attention in the last three decades. However, many studies focus on the special role that beer played in sumptuous prestige feasts and for conducting commensal politics with an emphasis on elite motivations. In this paper, I follow the approach of Susan Pollock and Reinhard Bernbeck and view the production of beer as a cornerstone of state exploitation in the early states of Egypt and Mesopotamia. I will briefly outline the archaeological and glyptic evidence for beer production in the early historic periods of the ancient Near East and its role in providing for the workforce of the early state. The consumption of beer as payment for state sponsored labor projects changes the commensal dynamics of society. Repeatedly consuming daily rations of beer at the location of labor creates an identity as worker and subject, i.e., one who works for someone else for their subsistence. In this sense, beer may have been crucial in creating both class identity for the worker, as well as providing the means of subjugation for the elites in society who controlled its production and distribution.

Kennedy, Kendra [254] see Bradley, Benjamin

Kennedy, Kendra [184] see Wescott, Konnie

Kennett, Douglas (UC Santa Barbara)
[15]

Discussant

Kennett, Douglas (UC Santa Barbara)
[23]

Experimentation, Domestication, and Intensification in Mesoamerica Prior to 3000 cal BP

The "Archaic Period" is an awkward normative category that obscures important behavioral ecological variability in Mesoamerica during the last 10,000 years. This cultural historical concept developed when little was known about the archaeology of Mesoamerica prior to the Classic Period (~2000 cal BP), but even today textbooks quickly dispense with this ~7,000-year interval as a period of gradual cultural change. We now know that Mesoamerica's staple crop, maize, was domesticated during this interval along with a range of other important tree and field crops. Agricultural systems intensified and maize became a staple crop of major dietary importance. Experimentation with the cultivation of tree-crops and other plants also occurred prior to 3,000 cal BP and became the basis of economies in the neotropical lowlands. There is also increasing evidence for the intensive exploitation of resources (e.g., fish and shellfish) from coastal environments that parallel agricultural intensification. I synthesize data from across Mesoamerica with an emphasis on the neotropical lowlands. Ultimately, I argue that normative categories like the "Archaic Period" undermine our understanding of adaptive variability and cultural evolutionary change in Mesoamerica and that greater emphasis should be placed on behavioral ecological variability through time.

Kennett, Douglas [270] see Alsgaard, Asia

Kennett, Douglas [237] see George, Richard

Kennett, Douglas [76] see Hixon, Sean

Kennett, Douglas [150] see Kate, Emily

Kennett, Douglas [15] see McCool, Weston

Kenoyer, Jonathan Mark [62] see Cameron, Asa

Keohane, Scott [38] see Murray, John

Kerchusky, Sarah (International Archaeological Research Institute Inc.)

[21]

Symbolic Behavior in Household Archaeology: A Study of Late Nasca Period and Loro Period Figurines from Zorropata, Nasca, Peru

Fifty-four fragmentary figurines, including 53 human and one animal forms, were recovered from archaeological domestic contexts at the site of Zorropata, located in the Las Trancas Valley, Nasca, Peru. Zorropata was a large domestic site with likely ceremonial function occupied from the Late Nasca period (ca. AD 450–600) until the early Middle Horizon/Loro period (ca. AD 600–1000). During the Middle Horizon (AD 750–1000) period the highland-centered Wari Empire established at least three colonies (Pacheco, Pataraya, and Inkawasi) in the Nasca Valley and its tributaries (Edwards 2010). Current research directed by Christina Conlee and Corina Kellner suggests a probable forth Wari colony and imperial administrative center at Huaca del Loro ca. 5 km down valley from Zorropata. The overarching aim of research at Zorropata has sought to elucidate the potential impact of Wari encroachment on Nasca society. This paper focuses of a facet of that relationship and investigates the use of figurines found in household contexts. While many questions remain regarding ritual and symbolic behavior in ancient Nasca, research supports that figurines probably had a ritual function, that they changed stylistically between the Late Nasca and the Loro periods, and that they may portray at least female and male gender identities.

Kern, Travis [214] see Brown, Erin

Kessler, Nicholas (University of Arizona), Gregory Hodgins (University of Arizona), Matthew Guebard (United States National Park Service) and Lucas Hoedl (United States National Park Service)

[135]

Wiggle-Match Dating at the Montezuma Castle Cliff Dwelling

Most radiocarbon measurements informing Bayesian models of cultural sequences are obtained from short-lived organisms such as annual plants and animal bone. Short-lived organic material from plateaus in atmospheric ¹⁴C production have a calibrated error which corresponds to the duration of the plateau. This fact hinders Bayesian modeling's ability to produce long-term, high-resolution, cultural chronologies. Sequential ¹⁴C measurements at known time intervals (wiggle-matching) can solve this problem. We present results of a recent wiggle-matching study from Montezuma Castle National Monument, an ancestral cliff dwelling in central Arizona. Historical looting has destroyed contexts for reliable ceramic cross dating, and dendrochronology is of limited utility for historical and ecological reasons. Previous attempts to radiocarbon date the site produced confusing results. Utilizing wiggle-matching, we produced high precision dates from the mid-twelfth and late thirteenth centuries AD, and infer an occupational history that involves early construction, partial destruction and disuse, followed by restoration and reoccupation. Significantly, this is the first high-precision chronometric sequence for a structure of this type in the area. Our results demonstrate that a combined approach to archaeological dating, using tactics from dendrochronology and radiocarbon dating, can objectively enhance Bayesian models of archaeological events, phase boundaries, and time spans.

Kestle, Caleb [188] see Monaghan, John

Kettunen, Harri [164] see McClean, Xavier

Key, Abigail [37] see Way, Phylicia

Khounani, Alireza

[267]

Trade as a Social Activity: Eastern Sigillata A and Its Near Eastern Emulation

The recent scholarly discourse places a great emphasis on social components that fostered ancient trade as a form of exchange. This paper attempts to utilize both technological and conceptual approaches to trade found in processual and post-processual paradigms in order to explore the socioeconomic evidence from the pottery tradition at Arsacid Seleucia on the Tigris; a tradition that denotes a certain bond between kin groups in the Mediterranean and Near East during the early centuries of the common era. The striking similarities in production method and forms of Eastern sigillata A tableware (ESA) and red-burnished ware (RBW), its local 'emulation' at Seleucia, indicate a close social interaction in the realm of exchange beyond the paradigm of disconnected producer vs. consumer. This interaction provided the ground for both cultural and technological dialogue between groups while allowing opportunity for local differentiation and innovation. Using fabric and typological analysis while maintaining an interpretive approach, this study aims to demonstrate that trade as a social activity moves beyond the existing cultural and political boundaries.

Khym, Do and Todd Ahlman (Texas State University)**[215]***Water Cisterns as Indispensable Elements for Prosperity of Eighteenth-Century St. Eustatius*

This research examines the importance of cisterns in the development of St. Eustatius as one of the most prosperous free ports in the eighteenth century and to produce a user-friendly 3D images of a plantation big house, cistern, and water catchment structure. The island is home to about 3,500 residents today, but it once supported up to 9,000 people in its commercial heyday in the seventeenth and eighteenth centuries as a center of trans-Atlantic slave trade and trade hub for the Caribbean and Western Hemisphere. Aptly named "The Golden Rock" for its role as a prominent global free port, the prosperity of St. Eustatius was aided by 94 cisterns that the colonists built because the island lacks fresh water sources such as streams or lakes. Cisterns use has declined as the local utility company, STUCO, supplies more running water to island residents. This research utilizes photogrammetry to highlight the water catchment and storage facilities at a plantation. Photogrammetry is a technology that processes photographs into 3D digitized renditions that facilitates propagation of archaeological knowledge to general public.

Kiahtipes, Christopher [235] see Perrotti, Angelina

Kibii, Job [232] see Waweru, Veronica

Kidder, Barry (University of Kentucky) and Scott Hutson (University of Kentucky)**[54]***Social Marketing and Provisioning the Populace along an Intersite Sacbe in the Northern Lowlands during the Late Preclassic*

During the Late Preclassic in the Northern Plains of the Yucatán Peninsula, a long-distance causeway linked together two micropolities, Ucanha and Uci, both of which concomitantly experienced demographic increases, several monumental constructions, and the foundations of institutionalized authority. While this landscape has nuanced ecological differences, this region lacks the "managed mosaic" of exploitable resources seen elsewhere in the Maya world that would have acted as centripetal forces coaxing settlement. Nevertheless, data from households at Ucanha and Uci indicate economic distribution patterns similar to that of small-scale marketing provisioned the majority of people with decorated ceramics, thereby augmenting their quality of life. Given that both of these sites included access to sacred landscapes linked by intrasite causeways, it is likely economic transactions occurred in conjunction with larger communal processions and pageantries that helped forge a sense of generalized trust wherein economic practices were rooted in the moral authority of emerging political institutions. However, the rise of Izamal as a regional superpower during the Protoclassic coincides with the dissolution of rulership; new ceramic distribution patterns that highlight exclusionary networks rather than more widespread provisioning of the populace; and population decline at Ucanha and Uci.

Kidder, Barry [128] see Plank, Shannon

Kidder, Tristram (Washington University)**[146]***Climate Change, Resilience, and Transformation in the Yellow River Floodplain, China*

Geoarchaeological research in China's Yellow River floodplain demonstrates the complex interplay of climate change and socio-political transformation in state-level societies. Using data from Anshang and Sanyangzhuang, Henan Province, this paper investigates the ways local communities evolved their behaviors as climates changed and as socio-political circumstances shifted from ca. 4500–2000 cal BP. Resilience at local scales was driven by bottom-up requirements to respond to climate; however, more importantly, local populations were responding to top-down political impositions from outside the community itself. Our work shows how resilience at the local level in these state-level societies required balancing climatic, environmental and socio-political challenges. Episodes of integration and fragmentation in these small communities mirror larger historical events, which exemplifies how these processes are linked at different scales.

Kiefer, Victoria [192] see Galloway, Tori

Kielhofer, Jennifer (University of Arizona), Joshua Reuther (University of Alaska Museum of the North), Charles Holmes (University of Alaska, Anchorage), Vance Holliday (University of Arizona) and François Lanoë (University of Arizona)**[82]***Geoarchaeology at Swan Point, Central Alaska: Insight on Past Environments and Site Formation Processes since the Late Glacial Period (~15,000 cal BP to Present)*

We synthesize geoarchaeological research at Swan Point, one of the oldest (~14,000 cal BP) archaeological sites in North America. Numerous publications summarize Swan Point's archaeological importance, yet few address its geoarchaeological significance. Early geoarchaeological work from the 1990s outlined a stratigraphic sequence of aeolian sediments and identified weakly developed buried soils associated with archaeological occupations. Fining-upward from sand to calcareous loess reflects dramatic landscape change since the last glacial period, and recent work refines initial models of environmental change and site formation. Micromorphology analysis indicates little to no soil formation during the deglacial period, but instead freeze-thaw processes may have preferentially concentrated organic matter into thin bands. Anthropogenic input may also have contributed to increased organic carbon concentrations within the sediments. Radiocarbon and luminescence ages document the depositional chronology at the site. Hand coring across the site landform reveals variation in sedimentation and deposit thickness, with the thinnest deposits at the knoll's apex. Finally, analysis of both small and large mammal remains demonstrates change also, from more open to more forested environments from the deglacial

and throughout the Holocene. This geoarchaeological synthesis enhances our understanding of environmental change within a dynamic, high-latitude landscape at Swan Point.

Kilby, David (Texas State University) and Marcus Hamilton (University of Texas, San Antonio)

[101]

New Dates for Bonfire Shelter, a Multicomponent Rock Shelter in West Texas

Bonfire Shelter is a well-known but imperfectly understood multicomponent rockshelter site located in a short tributary canyon of the Rio Grande in West Texas. The site is particularly known for three "bone beds" deposited between about 14,000 BP and 2,500 BP, two of which appear to represent mass bison kills. Three years of renewed investigation by Texas State University's Ancient Southwest Texas Project has resulted in new observations on the complex shelter stratigraphy including additional radiocarbon dates. This paper combines new and previous dates with stratigraphic observations in an attempt to generate a chronostratigraphic model that goes beyond the bone beds to include lesser known occupations and deposits in the rockshelter, and to provide a more comprehensive overview of depositional history and site formation at this classic site.

Kilby, David [68] see Koenig, Charles

Kilgore, Gertrude (University of Kentucky) and Claire Novotny (Kenyon College)

[228]

Coloring Outside the Lines: Engaging Diverse Audiences through Community-Based Archaeological Outreach in Belize

Archaeology education in the public sphere seeks to enrich understandings of the past by situating it in the present. Learning environments span multiple different environments and reach audiences with unique pedagogical interests. As researchers working outside our own communities, archaeologists conducting research abroad must work to develop public programming that provokes conversations about the past that are collaborative and accommodate diverse lived experiences. Using case studies from outreach programs initiated by the authors at sites in northwestern and southern Belize, we examine the strengths and weaknesses of various strategies for community engagement that acknowledges the interests of audiences of different age groups. Public programming developed for both sites sought to encourage dialogues within the respective communities around studying and preserving heritage. We seek to compare discussions conducted in meeting-style public programming targeted more toward adult audiences with educational tools developed specifically for children, such as coloring books and activities. We will explore the tools for developing sustainable public programming that is adaptable enough to engage the primary target audience and to appeal to broader audiences. Finally, we will use these experiences to inform a broader dialogue surrounding the impacts and contexts of effectively promoting community engagement through educational heritage outreach.

Kilikoglou, Vassilis (Institute of Nanoscience and Nanotechnology, NCSR Demokritos, Athens, Greece), Peter Day (University of Sheffield), Anno Hein (Institute of Nanoscience and Nanotechnology, NCSR) and David Wilson (Western University)

[196]

Early Bronze Age Ayia Irini, Kea: A Maritime Crossroads of Ceramic Traditions?

Over two key phases of the Early Bronze Age, the sheltered harbour of Ayia Irini, Kea formed an important link in the chain of sites across the Aegean, the backbone for the movement of resources, material culture and people that Renfrew characterised as the 'International Spirit' during the period before the emergence of early state organization in Crete. An extensive programme of petrographic and chemical analysis details a picture of ceramic exchange spanning the emerging centers of mainland Attica, Cycladic islands and the island of Crete. While these important findings of widespread trade are important in themselves, of significance to the current session are two aspects of the Period II and III ceramics at Ayia Irini, spanning the middle of third millennium BCE. Firstly, it offers the chance to examine technological continuities or disruptions with the arrival of the Anatolianizing 'Kastri' group in Period III, often suggested to herald the arrival of newcomers or demographic incursions. Secondly, its pottery straddles what were previously thought to be stylistic and culturally separate zones. In the large amount of ceramic imports from nearby Attica, does Ayia Irini offer a window on potters in mainland centers producing stylistically varied pottery specifically for export?

Killebrew, Ann [234] see Skinner, Jane

Kim, Alexander (Harvard University), Tatyana Savenkova (Krasnoyarsk State Medical University), Yevgenia Reis (Arkheologicheskoye Proyektirovaniye i Izyskaniya), Nikolai Makarov (Krasnoyarsk Regional Museum) and David Reich (Harvard Medical School)

[173]

Ancient Human Genomes Illuminate the Nonagricultural Neolithics of Central Siberia

The Eurasian steppe and its neighboring uplands and aridland oases have become the foremost stage of the past five years of genome-wide human ancient DNA research (Haak et al. 2015; Allentoft et al. 2015; Damgaard et al. 2018; Jeong et al. 2019; Wang et al. 2019; Narasimhan et al. 2019), with strongest focus resting on profound transformations that were propelled demographically and culturally by food production and domesticated ungulates (farming and pastoralism). The population histories of these regions articulate in still poorly-understood ways with the still vaster expanses of boreal Asia, where ancient DNA research remains far patchier (Sikora et al. 2019; Flegontov et al. 2019), and concepts like "Neolithic" that were first shaped on Near Eastern and European templates refract and dissolve in challenging ways. We present some of the first archaeogenetic explorations of the Central Siberian hunter-gatherer Neolithic and Early Bronze Age, with genome-wide aDNA data from the critical forest-steppe ecotone of the middle reaches of the Yenisey River—North Eurasia's greatest by length and discharge and a crucial border between

eastern and western Siberia—where the past century of archaeological research remains constrained by limited investigation and major relational uncertainties (Makarov 2005, 2013).

Kim, Jieun [244] see Shin, Dong Hoon

Kim, Lynn (University of Texas, San Antonio)
[200]
Chair

Kim, Lynn (University of Texas, San Antonio)
[224]

The Negotiated Yunga-Inka Landscape of the Camata-Carijana Valley

The Camata-Carijana Valley is situated on the eastern frontier of the Inka Empire in the Kallawaya domain and was inhabited by Chuncho groups from the tropical piedmont. To assess the relationships between these groups, the distribution of three key landscape features (community settlements, road network, and agrarian terracing) is placed on a spectrum of possible colonial landscapes from a state-controlled landscape (Model 1) to a locally-produced landscape (Model 2). Particular focus is paid attention to the architectural construction of settlements, their location on the prehispanic roads, and their association with types of agrarian terraces. It is concluded that the inhabitants were able to form local spaces of agency and take advantage of their Inka ties while living within largely a state-directed landscape. The locals established a new identity that tied them both to the lowland groups and to the highland Inka.

Kim, Sun [244] see Shin, Dong Hoon

Kindschuh, Sarah (Defense POW/MIA Accounting Agency Laboratory)
[153]
Discussant

King, Adam (SC Institute of Archaeology and Anthropology) and Johann Sawyer
[47]

Pipes, Pots, and Swirling Poles (Oh My!): Centered Worlds and the Legacy of First Man

First Man is a name we use for the male creator in Native American narratives of the Upper Midwest and Prairie Plains. He and his lineage are known by many different names, but their ritual associations are visible in the Braden styles and their historical successors. In epics such as the Red Horn cycle, these figures play foundational roles in the creation of the cosmos and the distribution of powers among lineages and genders. In this paper, we explore key aspects of First Man and his line through imagery involving the Earth Pot, smoking pipes, and the striped center pole.

[47]
Chair

King, Eleanor (Howard University)
[43]
Moderator

King, Eleanor (Howard University) and Michael Brennan (SEARCH, SEARCH 20)
[53]

Practical Pathways: Limestone Procurement and Ritual at Maax Na, Belize

Researchers have found that the limestone bedrock at prehispanic Maya sites in the Three Rivers Region of northwestern Belize crumbles easily and weathers badly. As a result, caves, which were central to Maya ritual, are few, and those that are present are small and prone to instability and internal collapse. In addition, the rock is of such poor quality that few carved monuments survive. We hypothesize that the local stone disintegrated too easily to be carved, so most of the altars, stelae, and other ritual markers were painted instead. Inhabitants of this area did not just do the best they could with the materials at hand, however. At the large site of Maax Na, geochemical evidence has suggested that they deliberately selected specific types of stone for some—not all—of their monuments. Maax Na is centered on the largest known extant cave in the area, whose offerings included speleothems imported from elsewhere. This paper explores the connection between limestone selection, monuments, and caves in the ritual and economic life of Maax Na in the Late Classic (C.E. 600–850), the period of peak site occupation.

King, Eleanor (Howard University)
[93]
Discussant

King, Jason [264] see Doubles, Catherine

King, Julia

[251]

Bridging the Divide: A Study of Fourteenth–Eighteenth-Century Native Settlements in the Middle Chesapeake

Archaeologists (including the author) investigating seventeenth- and eighteenth-century Native sites in the Chesapeake point out how materially different these assemblages are from those recovered from contemporary colonial sites. Characterized by materials almost wholly produced by Native hands with some objects of European manufacture, they are indeed different and have been used to argue that Native people in a colonized land resisted colonial control in part through the maintenance of Native practices. These assemblages, however, are rarely examined vis-à-vis assemblages from earlier Native sites or from contemporary Native sites, resulting in a not-so-subtle reinforcement of the deep history/colonial divide along with the assumption that the template (the “norm”) for this period is the European colonial site.

[251]

Chair

King, Matt (University of South Florida), Davide Tanasi (University of South Florida), Kaitlyn Kingsland (University of South Florida), Stephan Hassam (University of South Florida) and Reece Combs (University of South Florida)

[104]

Resurrecting Islam in Medieval Malta using 3D Digital Methods

Muslims have been an integral part of Maltese history from the ninth century onward. However, scholars have long ignored or minimized the role of Muslims on the island in keeping with the nationalist, pro-Christian identity of the modern nation of Malta. The history of these people is poorly recorded in the written record, but the discovery and digitization of over forty tombstone fragments from a Muslim cemetery, found in the area of the Roman Domus of Rabat, promises to shed light on this otherwise lost community. These fragments, which were unearthed during excavations in the 1920s, provide a testament to a substantial community of Muslims whose wealth and technical expertise allowed for the patronage of tombstones containing ornate Kufic script and geometric designs. When put in dialog with written sources, these archaeological finds testify to the enduring presence of Muslim communities in Malta during the medieval period. In the Summer of 2019, 38 Muslim tombstones associated with the site of the Roman Domus were scanned. Seven of these tombstones were captured using digital photogrammetry and the remainder were captured using a close range structured light scanner for the purposes of global digital dissemination and research.

Kingsland, Kaitlyn (University of South Florida), Reece Combs, Davide Tanasi, Stephan Hassam and Paolino Trapani

[104]

The Digital Afterlife of a Prehistoric Cemetery: The Case of Cozzo del Pantano (Siracusa, Italy)

The Middle Bronze Age (1450–1250 BCE) cemetery of rock cut chamber tombs of Cozzo del Pantano, located in the south-western hinterland of the territory of Siracusa, was excavated in 1892. The report of the excavation was published in 1893 but the rudimentary system of data recording and illustration of the many architectural features offered by the site and the concise form of the report of the excavation relegated it in the category of the “minor sites”. However a recent overall reappraisal of the materials collected in the tombs has proved the its great cultural relevance and also clear traces of post-prehistoric phases of reuse, which were never highlighted before. In summer 2019, an extensive terrestrial laser scanning effort was carried out on the south-western slope of Cozzo del Pantano, in order to document in a more accurate way all the archaeological features still visible, categorizing them all on the basis of the chronology so as to find a correspondence between the funerary assemblages and the tombs. The 3D model obtained will be used to create three-dimensional diachronic maps of the site in order to study eventual patterns and spatial distribution of the archaeological features related with later phases of reuse.

Kingsland, Kaitlyn [104] see Bonacini, Elisa

Kingsland, Kaitlyn [104] see Cali, Denise

Kingston, John [76] see Feak, Angela

Kintigh, Keith (Arizona State University)

[96]

Discussant

Kintigh, Keith (Arizona State University)

[115]

Discussant

Kipnis, Renato (Scientia Consultoria Científica), Solange Caldarelli (Scientia Consultoria Científica), Leticia Muller (Scientia Consultoria Científica), Andrey Castro (Scientia Consultoria Científica) and Aguinaldo Marques (Scientia Consultoria Científica)

[161]

A Historical Perspective on the Nature of Precolonial Settlements in the Middle Xingu River Basin

In order to understand the processes that generated the rich, complex and diverse cultural and environmental history present in Amazonia, and specifically along the Xingu River basin, it is crucial that we generate information on when, where, and how small-scale foraging societies changed to more sedentary lifestyles and complex social arrangements based on agriculture. Here we present and discuss the archaeological record generated by research carried out within environmental licensing process of the Belo Monte Hydroelectric Power Plant in the Middle Xingu River, state of Pará, Brazil, which involved systematic regional survey and the

study of closely to 200 archaeological sites. It shows continuous human occupation dating back to the late Pleistocene throughout the Holocene period; with great variability in space and time of archaeological sites and material culture. The high-resolution archaeological data presents the potential to discuss issues such as the antiquity of human occupation; the emergence, or not, of hierarchical organized systems; changes in mobility and settlement pattern; gaps in the archaeological record during the middle Holocene period; the spread of agricultural practices, and dispersion of Tupi and Koriabo ceramic in the region.

Kirakosian, Katie (UMass Amherst)

[56]

Dena Dincauze: The Matriarch of New England Archaeology

Dena Dincauze (1934–2016) made a great impact throughout her archaeological career, not only in New England, but also throughout North America, more broadly. As one of the first women to receive her PhD from Harvard University, Dena was also one of the first tenured female archaeology professors in the state of Massachusetts. She also took professional service very seriously, serving as the first female editor of *American Antiquity* from 1981 to 1984, for example. Her service did not go unrecognized, having received the SAA's Distinguished Service Award in 1997 and a Lifetime Achievement Award from the Massachusetts Historical Commission in 2001, for her support of cultural resource management. Dena also mentored many graduate students and worked with countless avocationalists throughout her career, who continue to expand her legacy in the field of archaeology.

[56]

Chair

Kirgesner, Samantha (Ohio State University) and Julie Field (Ohio State University)

[76]

An Analysis of Marine and Riparian Mollusks from Sigatoka Valley, Fiji

Modern concerns about the health of Fiji's coastal environment are increasing, especially following recent climate events (2016–2017) that resulted in coral bleaching and mass die-offs of reef fish. This study attempts to identify past interactions with aquatic environments in Fiji through the analysis of archaeological assemblages of marine and riparian mollusks. Assemblages generated from excavations in the Sigatoka Valley of Viti Levu in 2001–2002 reveal different combinations of marine and riparian species. Quantitative analyses are employed here to assess subsistence changes and whether there was a focus on one type of mollusk over the other. Mapping the corresponding habitats of each species, size and frequency of individuals, and the distances involved in their transport can identify possible incentives for foraging for particular species during times of environmental stress. Tracing the interactions of humans with the environment allows for the identification of periods of overutilization, which may have prompted a switch in focus on subsistence strategies. By classifying past interactions with these aquatic resources and understanding changes these past people conducted we may be able to better understand what future changes can be made to protect the aquatic environments in Fiji.

Kirk, Scott, Jonathan Dombrosky (University of New Mexico), Cyler Conrad (University of New Mexico) and Emily Lena Jones (University of New Mexico)

[129]

Tracking Exchange through Stable Isotope Analysis: A Preliminary Study of the Turkeys from Tijeras Pueblo, New Mexico, USA

The substantial turkey assemblage from Tijeras Pueblo, occupied between 1300 and 1425 CE, has provided important information about variability in turkey management in the American Southwest/Mexican Northwest. While many studies have suggested that genetically domestic prehispanic turkeys across the region were consistently penned and fed a maize diet, the turkeys recovered from Tijeras Pueblo do not follow this pattern (see Jones et al. 2016). Here, we use previously published carbon and nitrogen stable isotope data in conjunction with new hydrogen and oxygen stable isotope data to explore questions about trade, environment, and connectivity in the Pueblo IV (Classic Period) Middle Rio Grande. Our combined analysis shows that the Tijeras turkey diets may have been a function of local exchange systems. Our study tests the practicality of combined hydrogen and oxygen isotope data as measure of resource exchange as well as the importance of trade in managing turkeys at Tijeras Pueblo.

Kirkland, Brenda [237] see Peacock, Evan

Kisielinski, Caroline [244] see Potter, Bethany

Kisielinski, Caroline [100] see Stone, Jessica

Kistler, Logan [229] see Gaffney, Isabella

Kitchel, Nathaniel (Dartmouth College)

[30]

Getting It Right for the Wrong Reasons: Using ED-XRF to Characterize Red Munsungun Chert

Distinctive red chert attributed to the Munsungun Lake geologic formation of northern Maine appears frequently in terminal Pleistocene fluted point period sites in New England. Despite the macroscopic visual similarity of red chert artifacts across the region no large-scale effort had been made to evaluate these visual identifications through geochemical techniques. To address this situation, in 2013 I employed laboratory-based ED-XRF to analyze over 200 artifacts from 24 separate fluted point sites or activity loci from Maine to Connecticut. This analysis indicated that that virtually all the red chert artifacts in this analytical assemblage arose from one or two closely related outcrops. Subsequent geoarchaeological prospection and geochemical analyses have supported

these results. While the findings of the original study appear sound, I believe these positive results arose not from rigorous sampling design and careful selection of analytical methods but rather from the specific geologic characteristics of Munsungun Lake "chert". In this presentation I will discuss why Munsungun chert proved amenable to sourcing by the methods I employed to illustrate how geology came to the rescue of my initial study, and how in this case my research design was more lucky than good.

[30]

Chair

Klassen, Sarah (University of British Columbia) and Alyssa Loyless (University of York)

[26]

Urban Scaling and Agricultural intensification: A Case Study from Angkor, Cambodia

Angkor was the heart of the Khmer Empire for over five centuries from the ninth to thirteenth century CE. During this time, a polycentric metropolis emerged that, at its height, may have been home to nearly one million people. These people lived in two distinctive areas: densely occupied urban cores and suburban agricultural zones. The rice production in the suburban agricultural zones was a key element of the Angkorian economy with rice fields covering over 1,000 km² of the Greater Angkor region. Among the rice fields were over a thousand small temples that formed the economic and social loci of communities, including rice production. Spatial and chronological advances, using remote sensing and semi-supervised machine learning, have now allowed archaeologists to place these temple communities and their associate rice fields in time and space. In this paper, we investigate the diachronic relationship between the urban population density of Angkor and land productivity. This analysis provides valuable insight into the relationships between urban scaling and agricultural intensification with implications far beyond medieval Cambodia.

Klassen, Sarah [28] see Attorre, Tiago

Klaus, Haagen [105] see Shimada, Izumi

Klaus, Haagen [131] see Turner, Bethany

Klehm, Carla (University of Arkansas) and Laure Dussubieux

[249]

Why Indian Ocean Beads in the Southern African Interior Matter: Linking Global Objects to Local and Regional Change

The dispersal of Indian Ocean glass beads has helped archaeologists reconstruct over 1,500 years of prehistoric and historic trade links across multiple continents. These beads play a particularly important role for including places where written documents of this trade do not exist nor cover. For example, glass beads provide material proof of linkages from the Middle East and India to areas a thousand miles into the southern African interior, where peoples engage in this global economy through trade in exotic animal skins, ivory, gold, and other products. Rather than using beads to simply delineate the "peripheral regions" or "peripheral peoples" of Indian Ocean trade connections, this presentation will center on the sociopolitical and economic changes taking place in the southern African interior: the circumstances in which glass beads are being incorporated into peoples' lives. Glass beads from multiple sites in the Bosutswe region of east-central Botswana will be discussed in context with other artifacts, and used to build a narrative of changing social identities, economic tensions, political centralization, and regional power struggles among competing factions for control over resources associated with this long-distance trade. The case study will demonstrate how global objects may elucidate local and regional-scale societal dynamics.

Klein, Kerri (Cardno)

[213]

Clothing at Fort Brooke: Buckles, Buttons, and Fabric (Oh My!)

Organic materials are rarely represented in the archaeological record in subtropical, sandy Florida. The city of Tampa grew around what was originally Fort Brooke, a military outpost in the swamps of Florida that was occupied from 1824–1882. Surprisingly little is known not only about the fort, but about the individuals who lived there. Tiny scraps of fabric, the largest of which is smaller than a postage stamp, attempt to aid in our understanding of textile choices and availability. A study of recovered artifacts of clothing, mainly buttons and belt buckles, compares recently excavated materials with those recovered from a previous Fort Brooke excavation in an attempt to pinpoint similarities and differences in clothing choices across the entire Fort Brooke site. These artifacts and textiles can help shed light on the trading networks surrounding a military outpost in frontier Florida.

Klein, Terry

[115]

Discussant

Klenck, Joel (Yes), Mohammed Sahib (Centre of Samoan Studies, Archaeology & Cultural H) and Seiuli Temese (Centre of Samoan Studies, Samoan Language & Cultur)

[252]

Archaeology of Luatele Crater: Ritual and Prestige of the Tuimanu'a, Ta'u Island, American Samoa

An archaeological survey covering 50 acres was conducted in and around Luatele or Judds Crater, an extinct volcano, on Ta'u Island, Manu'a District, American Samoa. The project identified twenty-four precontact sites comprising 101 archaeological features and a 142 m cave associated with the Samoan demi-god Vaatausili. These features include star mounds, oval boulder mounds, platforms, rock walls, and terraces associated with Solo Tagata or "line of people." At the base of the crater is a large mound, with small stone mounds and walls, surrounding this central edifice. The archaeological features and cultural histories of Luatele suggest

ritual and socio-political sources of mana or prestige for the persistent dynasty of the premier chief, Tuimanu'a, in addition to intensification of agricultural production.

Kles, Maranda (Archaeological Consultants Inc)

[153]

Discussant

Klesner, Catherine (University of Arizona) and Pamela Vandiver (University of Arizona)

[261]

Reconstructing Production Technology of Medieval Lead-Glazed Ceramics from Central Asian Silk Road Sites

Central Asia has long been the connecting bridge facilitating the long-distance trade of goods across Eurasia. While Central Asian communities have served as trading centers, they were also producers of specialty goods and centers of technological innovation themselves. In this study we examine the technological variation within and between locally produced Central Asian glazed ceramics and imported Islamic lead-glazed wares during the Early Islamic Period. Compositional analysis of ninth–twelfth centuries CE ceramics excavated from seven Silk Road sites located along the northern edge of the Tien Shan mountains in southern Kazakhstan has demonstrated local production of lead-glazed ceramics and the concurrent presence of imported ceramics from Southwest Asia. Twenty-four ceramics were characterized by scanning electron microscopy-energy dispersive spectroscopy (SEM-EDS), and electron microprobe analysis (EPMA) including examples of locally produced ceramics (n=7), imported ceramics from Southwest Asia (n=12), and lead-glazed ceramics whose origin was unidentified by compositional analysis (n=5). Through electron microscopy we are able to reconstruct Central Asian production technologies for lead-glazed ceramics as well as define the range of variation seen between the Central Asian and Southwest Asian Islamic ceramic traditions.

Klessig, Barbara (Humboldt State University)

[228]

Integrating Archaeological Textiles into Mainstream Archaeology/Anthropology Curriculum

The study of textiles has a lower profile in archaeological research than many other artifact classes. Possible reasons include the current and past devaluation of women's work and/or the relative rarity of this find-class. This presentation looks at how textiles could be better integrated into the teaching of archaeology at universities, as a step toward joining the mainstream. To accomplish this, educators must emphasize the importance of textiles to the next generation of archaeologists and researchers, what should be included in primarily textile-focused courses, how archaeological textile studies can be incorporated into other courses, and how textile studies can fit within the goals of university and department courses and curricula, diverse teaching styles, and research foci. Most of us do not think of where the textiles we wear every day came from, how they were created, and the technologies that are used in creating textiles for our use. Studying textiles, both modern and ancient, can provide us with better understandings of traditional craft production; the technologies and tools that go into the creation of textiles; how textiles fit into trade, exchange, and commerce; and the roles of textiles as cultural/societal indicators.

Klimaszewski-Patterson, Anna (California State University, Sacramento)

[117]

Discussant

Klokler, Daniela (Universidade Federal de Sergipe, UFS)

[252]

Sharks, Rays, Monkeys, and the Modified Fauna from Piaçaguera

Pre-colonial groups used various types of raw materials for manufacture of tools and adornments: rocks, clay, fibers, bones, shells, among others. In general, lithic and ceramic assemblages gain more focus from researchers due to their ubiquity and better preservation. Shell mound sites, however, provide a context in which faunal remains are the main components of the matrix and the study of their modifications is facilitated. The study of the social and symbolic use of artifacts and adornments made with faunal remains allows a glimpse on the understanding of human societies relationships with the animal world. In this paper I present findings about the worked bone and shell assemblage from Piaçaguera site, a shell midden (sambaqui) from eastern Brazil. The faunal assemblage includes over a thousand tools and adornments recovered from excavations. Bone points (gorges) and modified teeth (from sharks and monkeys) are the most dominant types of artifacts at this site, and the majority of pieces are associated with burials. The results appear to show a preponderance of aquatic animals (sharks and rays) in tools manufacture and terrestrial animals (particularly monkeys) for adornments.

Kmiec, Theodore (Texas State University)

[47]

Kings, Gods, and the Cosmos: A Revisitation of Olmec Monumental Art Styles

During the Middle Formative Period on the Gulf Coast, the Olmec culture created monumental art that was heavily influenced by interaction with other Mesoamerican cultures and influenced later Mesoamerican cultures. The two major art styles found in Olman are the San Lorenzo Style (1200–900 BC) and the La Venta Style (900–400 BC). The San Lorenzo Style focused on human/ archetypal figurines and larger monuments such as the famous robust Olmec heads. The La Venta Style also focused on large monumental heads, altars, and the first stelae recorded in Mesoamerica. This presentation will focus on the re-examination of La Venta stelae and show new iconographic analyses of these stelae. The goal of these analyses is to show evidence that these Olmec stelae recorded the

first examples of ideological narratives, cosmological events, and kingship that are found in later Mesoamerican cultures' artistic corpora.

Knell, Edward (California State University, Fullerton)

[253]

The Organization of Terminal Pleistocene–Early Holocene Lithic Technology around Pluvial Lake Mojave

This paper describes how the prehistoric occupants who camped along the terminal Pleistocene–Early Holocene (TP-EH) shorelines of pluvial Lake Mojave, Mojave Desert, California organized their lithic technology. Specifically, an overview is provided of the lithic raw material procurement and land use, tool production, use, and discard strategies. Data to assess these technological strategies derive from 16.7 km² of pedestrian survey along the shorelines of Lake Mojave and the analysis of approximately 1,750 artifacts of TP-EH age (approximately 1,600 chipped stone artifacts were analyzed in the field and another 150 artifacts from extant collections). The artifacts include projectile points, bifaces, uniface tools, cores, and debitage. The artifacts were analyzed to assess the flow of lithic raw materials and tools into and through the various sites that comprise the TP-EH record of human occupation around Lake Mojave, and to ultimately establish how Lake Mojave's TP-EH inhabitants organized their lithic technology.

Knoerlein, David

[132]

Digital Photography: From Mass Graves to the VCP

This paper will demonstrate how forensic digital imaging techniques developed in Iraq transitioned into the Veterans Curation Program to create a new standard for artifact photography. Under the command of Sonny Trimble, Dave Knoerlein, a certified forensic photographer, created and managed a complete digital imaging solution for documenting mass grave investigations in Iraq to prosecute Saddam Hussein. Sonny insisted that the image quality had to be of the highest standard to show fine details of the trauma to skeletal elements and all the artifacts associated with the remains. Developing and enforcing a stringent protocol for photography was crucial because the images would be considered evidence in world court hearings. In 2009 Sonny asked Knoerlein to create and manage multiple digital photography labs for the Veterans Curation Program utilizing the same techniques and standards used in Iraq. Since day one of the VCP, Knoerlein has trained every single veteran and lab manager how to photograph artifacts using the latest digital technologies to produce museum quality images consistently without performing any post processing.

Knox, Corey, Sara Chavarria (University of Arizona), Barbara Mills (University of Arizona) and Stanley Bond (National Park Service)

[160]

Effective Experiential Learning Strategies That Critically Engage High School Students in Archaeology and Heritage

The Linking Southwest Heritage through Archaeology project (LSWTHA) is a program funded by the National Park Service at the University of Arizona, that centers National Parks and Heritage sites and archaeology field experiences as places for Latinx and Native American high school students to explore their own heritage, cultural knowledge, and assumptions, and learn about the possibilities for higher education and careers. The LSWTHA has designed a framework entitled ArchP4, which connects Archaeology to practice, personal exploratory spaces, professions and career options, and people and places. Through program activities such as exploring cultural heritage resources in national parks, participating in archaeology field schools, and learning from experts in various archaeology fields, students experience and interpret the rich cultural history of the Southwest and the practices used by historians and archaeologists to tell the story of the Indigenous and Hispanic presence in the Southwest. In this presentation we will share the processes, outcomes, and effective practices of this multidisciplinary partnership between the National Park Service, the Department of Archaeology, the College of Education, and our many partners in the community.

Knox, Corey [184] see Viola, Tony, IV

Knudson, Kelly [134] see Alonzi, Elise

Knudson, Kelly [134] see Hall, Sarah

Knudson, Kelly [61] see Martinez, Marcos

Knutson, Jennifer [193] see Malo, Erika

Koenig, Charles (University of Wyoming), Christopher Jurgens (Texas State University), David Kilby (Texas State University), Kevin Hanselka (Texas Department of Transportation) and Lorena Becerra-Valdivia (Oxford Radiocarbon Accelerator Unit)

[68]

Multidisciplinary Investigations of a Folsom-Age Bison Butchery Event in Eagle Cave, Texas

Eagle Cave is one of the largest rockshelters in the Lower Pecos Canyonlands of southwest Texas. Archaeologists previously excavated Eagle Cave in the 1930s and 1960s; however, they reported no evidence indicating Paleoindian occupation of the site, even though Bonfire Shelter (located ~400 m upstream) demonstrates Paleoindian use of the immediate landscape. From 2015–2017 the Ancient Southwest Texas Project of Texas State University conducted new excavations in Eagle Cave. In addition to sampling 3 m of stratified Holocene sediments, we exposed and sampled Paleoindian deposits ranging from 10,300–13,100 cal BP. The largest Paleoindian feature was a dense scatter of fractured, cut, and burned Bison antiquus bones. Amongst the bones were chipped stone debitage, lithic tools, decomposing plant remains and one surface hearth containing charred bone, ash, and charcoal.

Radiocarbon assays from organics date the assemblage to ~12,500 cal BP, which places this feature into the time span of Folsom. The unique Folsom-age rockshelter assemblage provides well-preserved suite of ecofacts rarely preserved in Paleoindian sites, and based on preliminary analyses, represents the secondary processing of a juvenile *Bison antiquus*. This paper summarizes the ongoing spatial, faunal, macrobotanical, chronometric, and lithic analyses being conducted on this Paleoindian assemblage.

Koetje, Todd (Western Washington University)

[27]

Chair

Kohler, Tim (WSU/SFI/CCAC) and J. Daniel Rogers (National Museum of Natural History)

[26]

The Theory of the Adjacent Possible and Settlement Scaling Theory

The Theory of the Adjacent Possible (derived mostly by Stuart Kauffman) generates expectations for the rate of growth of the number of functional tool types through time. These are examined using data from the Old World and from the U.S. Plains (River Basin Survey). We review apparent congruencies between the foundations of TAP and settlement scaling theory.

Kohler, Tim (WSU/SFI/CCAC)

[171]

Discussant

Kohler, Tim [229] see Bird, Darcy

Kohler, Tim [125] see Gillreath-Brown, Andrew

Kohut, Lauren (Bowdoin College)

[32]

Discussant

Kohut, Lauren (Bowdoin College)

[200]

Centering the Provincial in Inka Provincial Landscapes: A Case Study from the Colca Valley (Arequipa, Peru)

Studies of Inka architecture and settlement planning in provincial regions often convey an image of Inka power emanating across the empire through the creation of a new political and spatial order. The reconfigured landscape of administrative centers, relocated communities, and terraced hillsides connected by networks of roads, storage facilities, and waystations is understood as the means through which the empire cemented control over conquered populations both ideologically and spatially. And yet, Inka provincial landscapes were never solely Inka constructions, but instead emerged in relation to existing local norms and practices. Rather than examining provincial landscapes from the perspective of the order the Inka imposed, this paper explores how Inka spatial practices were made to contend with existing practices, norms, and built landscapes. Here, research from the site of Auquimarka, a Late Intermediate Period hilltop fortification turned minor Inka administrative center, in the Colca Valley (Arequipa, Peru) provides a case study for examining the articulation of imperial and local spatial logic.

Kolak, Tatjana [35] see Zavodny, Emily

Kolar, Miriam (Visiting Scholar, Amherst College)

[25]

Archaeoacoustics of an Elite Inca Setting: Sonic Dynamics atop the Central Plaza Platform at Huánuco Pampa, Peru

Archaeoacoustical fieldwork enables empirical testing, measurements, and documentation of sonic dynamics in archaeological sites, and provides experiential demonstrations useful in emplaced human perceptual contextualization of acoustics. Enlivening archaeological materials and settings via acoustical reconstructions facilitates physics-based and psychoacoustical understandings of cultural materials and site features that are more typically characterized via static representations and non-sensory interpretative paradigms. At the Inca administrative center, Huánuco Pampa, a highland complex along the Inca Road (Qhapaq Ñan), we conducted an acoustical field survey on and around the well-preserved central plaza platform (colloquially known as its "ushnu"), the largest of such known structures. My methodological framework for cross-comparing systematic and repeated human performance of a sequence of archaeologically appropriate soundproducers and musical instruments across all survey points, employed in that study, revealed specific interdynanical affordances of emplaced soundmaking, refining functional hypotheses of site architecture, and offering realistic parameters through which to assess past-use scenarios and experiential potentialities. Here, I discuss the platform-top acoustics revealed by our study and the implications of these features for communication on and around the platform, and I relate these findings to discourse about Inca sonic technologies and music making.

Kolar, Miriam (Visiting Scholar, Amherst College)

[266]

Discussant

[266]

Chair

Kolb, Charles (National Endowment for the Humanities, Retired)

[152]

Discussant

Kolb, Charles (National Endowment for the Humanities, Retired)

[181]

Discussant

Kolb, Michael (Metropolitan State University of Denver), Christine Pink (Metropolitan State University of Denver) and William Balco (University of North Georgia)

[169]

Late Bronze Age Reuse of a Late Copper Age Chamber Tomb in Western Sicily

Western Sicily was a locus of significant social and technological transformation during the second and first millennia BCE. Local populations adopted new metallurgical skills alongside feasting and mortuary traditions, attesting to a broad social transformation. This paper explores archaeological and demographic evidence of this transformation as collected from a reused Late Copper Age tomb at Contrada Pitrazzi, near modern Salemi, Sicily.

Kolega, Matija (Eckerd College) and Allan Meyers (Eckerd College)

[197]

A Window into Landscape Inequality: Architectural Contrasts at Newfield Plantation, Cat Island, Bahamas

Britain's policy of taxing residential windows in the eighteenth- and nineteenth-centuries accelerated a form of class-based architectural inequality. Elites distinguished their homes by featuring an ever-increasing proportion of exterior windows. At the same time, the relative frequency of windows in working-class dwellings declined. The window tax did not extend to British colonies overseas, so the extent to which this type of material inequality would appear in contexts of colonial stratification and unfree labor remains an open question. The well preserved ruins of Newfield Plantation, a nineteenth-century estate on Cat Island, Bahamas, provide an opportunity to examine the issue. Recent investigations there employ a window-to-wall ratio (WWR) calculation to gauge the percentage of exterior wall area devoted to window openings at each dwelling. Empirical findings suggest a strong correlation between WWR and other measures of architectural inequality. Although plantation management had no immediate tax incentive to reduce the presence of windows in the dwellings of enslaved tenants, the evidence suggests that a conspicuous window disparity was still part of the built environment. WWR thus has the potential to be an insightful measure of social inequality in the study of British colonial landscapes.

Kolhatkar, Manek (Université de Montréal)

[6]

Contexts of Contexts: Using Palimpsests to Reevaluate Archaeological Concepts, Methods, and Stories

Archaeologists have begun in recent years to look more closely at the structure of the archaeological record as archaeological palimpsests challenge them to do. What stories they can tell with such materials remains problematic, however, given how alien they are to the familiar and lived experience of the world as we have come to know it. This study draws from such narrative materials to reevaluate some of the analytical concepts and methods currently used in archaeological research. The limits of the chaîne opératoire are emphasized, as the plowed field from a remote site in Quebec becomes the context where such limits can be revealed and assessed. As a chaîne opératoire becomes constrained within a blank, how should we work with what lies beneath a blank? As a plowed field renders mnemonic, genealogical or adaptive frameworks of understanding useless, how should we relate dispersed blanks with one another? In forcing us to take a closer look at the way we know the world, plowed fields may help us in creating other ways of knowing it. One such possible way is addressed here.

Kollias, George (Brandeis University)

[130]

Operationalizing Debt in the Context of Ancient Maya Political Economies

The notion of debt pervades anthropological discussion of political economy and exchange. Often used as a descriptor of unequal relationships it also embodies notions of reciprocity, expectation, and mutuality. Debt carries with it a charged negativity in many contexts, conveying experiences of precarity and violence, pressure and visibility. However, debt can be considered as an important tool in the production of social cohesion, the maintenance of relationships, and the reproduction of economic networks. Here debt will be discussed as a factor in the development of authority, the creation of stratified hierarchical relationships, and as a function in economies of reciprocity which characterize ancient communities. This discussion applies an anthropological notion of debt in the archaeological study of ancient Maya political economies, hierarchical relationships, community integration, and commodity exchange. This discussion aims to posit how we may incorporate anthropological notions of debt and embedded concepts of morality and sociality as a means to understand underlying factors in the social dynamics of hierarchical societies in the ancient past. Of particular import is the role social and economic indebtedness, and expectations of reciprocity, may have played in integrating the countryside surrounding major polities and mediated relationships with the hinterlands between ancient kingdoms.

Kollias, George [265] see Scherer, Andrew

Kolpan, Katharine (University of Idaho)

[91]

Discussant

Kolpan, Katharine (University of Idaho)**[153]***Moderator***[153]***Discussant*

Kolpan, Katharine [188] see Passalacqua, Nicholas

Kolvet, Renee [199] see Simmons, Alan

Komp, Rainer (German Archaeological Institute)**[107]***The Roman Auxiliary Camp "Augusta Praetoria"*

A large scale geomagnetic survey performed by the German Archaeological Institute in collaboration with the University of Pécs discovered details of a Roman auxiliary camp in the Carpathian Mountains. Known as 'Augusta Praetoria', it was built in the time of the Roman emperors Trajan and Hadrian and existed until the middle of the third century AD as a fortress of the Dacian Limes, which was part of the Roman Empire's pan-European fortification wall. Although the volcanic stone material used for construction impedes geomagnetic data acquisition, the survey provided an exact layout of the walls and important architectural features of the interior space. Up to four phases of wooden and stone fortification walls and the corresponding construction of gates with towers can be identified. This corresponds to inscriptions, preserved on reused stones, specifying repairs and extensive rebuildings at the end of the second century and in the middle of the third century AD. The complete new development of the walls each time suggests, that the castrum has been severely damaged or even destroyed, then probably abandoned, but reclaimed several times during its function as auxiliary castle for the limes.

Komp, Rainer [107] see Ruby, Bret

Komulainen-Dillenburg, Nancy (USACE)**[256]***USACE St. Paul District Regulatory (Corps) Commitment to Open and Transparent Communication and Consultation with Tribes, In Review*

Following a multi-year effort called the Tribal Assessment and Consultation Planning Project (TAP), St. Paul District Regulatory (Corps) implemented robust and innovative measures for consultation and coordination with our Tribal Nations. The TAP Initiative launched in 2018, in an effort to ensure early, open, and transparent communication of the Regulatory Program, utilizing new and innovative tools and educational materials developed specifically for Tribes. Overall, the TAP Initiative has demonstrated significantly more transparency and relationship-building, shown in more frequent and open communication, information sharing, and building trust between the Federal agency and Tribes. Today's discussion focuses on the successes and lessons learned during the initial one-year pilot of the TAP Initiative and the subsequent long-term establishment and commitment of the TAP Initiative within the St. Paul District Regulatory Program; and, the export of the TAP Initiative to other Corps Districts across the Nation.

Kong, Deming [94] see Liu, Yu

Konsitzke, Charles [188] see Jamison, Gregg

Konsoer, Kory [9] see Britt, Tad

Kooiman, Susan (Southern Illinois University, Edwardsville) and Aaron Comstock (Ohio State University)**[264]***Environmental and Culinary Relationships in the Northern Great Lakes*

Shifting culinary traditions observed among Woodland-period Indigenous groups in the northern Great Lakes region have prompted inquiry into the factors that influence an array of food-related behaviors. Exploration of the relationship between the environment and foodways constitutes one dimension of modeling for culinary change. The Living Blended Drought Atlas provides fine-grained data on past moisture availability that could impact food availability and distribution. The nature and timing of rainfall fluctuations in northern Michigan between AD 750–1500 are compared to previously observed shifts in food selection and cooking habits between the early Late Woodland (ca. AD 900–1000), late Late Woodland (ca. AD 1200–1300), and Late Precontact/Iroquoian (ca. AD 1300–1500) occupations of the Cloudman site (20CH6), located on Drummond Island, Michigan, in Lake Huron. The results facilitate identification of the roles of environment, cultural traditions, and social interactions in influencing the diachronic trajectories of foodways and cuisine.

Kooiman, Susan [235] see Albert, Rebecca

Kooiman, Susan [233] see Frederick, Kathryn

Koons, Michele (Denver Museum of Nature & Science)**[43]***Discussant*

Koons, Michele [156] see Baxter, Erin

Koons, Michele [198] see Mandel, Rolfe

Koontz, Rex (University of Houston)**[141]***Chair***Koontz, Rex (University of Houston)****[227]***Classic Veracruz Sculptures and Bodies in Fragments*

As part of a larger study on Classic Veracruz fragmented bodies and sculptures, I sketch two case studies of contexts in which fragmented yokes, decapitated heads, and figurine body fragmentation come together in Protoclassic and Early Classic Tres Zapotes and Cerro de las Mesas.

Kornfeld, Marcel (PIRL - University of Wyoming) and Mary Lou Larson (University of Wyoming)**[103]***Ruthann Knudson: Colleague, Friend, Mentor, and Much More*

Ruthann Knudson's career in archaeology began with work on Midwestern ceramics in 1963 at the University of Minnesota and spanned nearly six decades. During that remarkable time, she taught at academic institutions; engaged in contract archaeology; conducted much research focused on Paleoindians and lithics; surveyed, excavated, and analyzed material from throughout North America; coordinated Native American consultations; developed public museums; lobbied for archaeology at the national level; mentored students and colleagues; and much more. In this presentation, I illuminate some of Ruthann's contributions to archaeology.

[103]*Chair*

Kornfeld, Marcel [103] see Larson, Mary Lou

Kornfeld, Marcel [180] see Mahan, Chase

Kosiba, Steve (University of Minnesota)**[272]***Discussant*

Koski-Karell, Daniel [271] see Pestle, William

Kostic, Aleksandar [173] see Plattner, Paige

Koszkul, Wieslaw [128] see Zralka, Jaroslaw

Kosztura, Juan Miguel [257] see Sánchez Mosquera, Amelia

Kotegawa, Hirokazu (Universidad Nacional Autónoma de Honduras)**[191]***Esculturas monumentales como herramientas políticas en la sociedad olmeca: Una perspectiva desde el sitio Estero Rabón*

Las esculturas olmecas muestran un alto desarrollo estético desde su aparición. Sin embargo, estas esculturas no fueron sólo obras del arte sino también tenían una gran importancia socio-económica en la sociedad olmeca. Por ello, se piensa que estas esculturas monumentales fueron otorgados por las elites olmecas. Otro lado, el sitio arqueológico Estero Rabón se encuentra en el sur de la costa del Golfo de México. Apareció y jugaba el papel importante como un centro secundario de la capital olmeca San Lorenzo y también posiblemente de La Venta durante la época de la cultura olmeca. En este sitio se han encontrado las ocho esculturas olmecas de gran tamaño y en distintas formas. En el presente estudio se intenta buscar la función de estas esculturas de Estero Rabón a través de la comparación de las formas y/o de los temas representados con otros sitios olmecas.

Kotis, India (Kenyon College) and Karinne Robbins (Kenyon College)**[77]***Between Mind and Matter: Patterns of Discourse in Desktop Graffiti*

This research examines 2,400 samples of desktop graffiti (pictures or words that are drawn or etched into the wood of a writing desk) collected from an Ohio liberal arts college study space, establishing chronology when possible. Much of what is written in the

graffiti approximates patterns of discourse on social media websites like Facebook, Reddit and Twitter. We therefore use archaeological theories of materiality to probe why modern college students, as digital natives, choose to express themselves on material surfaces when they can easily express the same things online. Many graffiti samples follow a similar pattern: A central phrase or drawing ("locus"), and one or multiple "answers" to that locus. These answers can take the form of words or sentences responding to the locus via arrows, as well as revisions of the locus itself. Revisions usually either reify or change the meaning of the locus, and provide evidence of the uncensored sociopolitical values held by the student body. We conclude that students engage in desktop graffiti to cultivate an uncensored community. Because it is anonymous, desktop graffiti affords a space for frank expression of the taboo, whether that be vulgar sexuality or unpopular politics.

Kouba, Jamie

[213]

Finding Traces of the Past by Using Archaeological Excavations and Penetrometer Data

The site of Newport, Pennsylvania is a ghost town; almost no traces of the once vibrant transportation hub still exist above the ground. Newport, founded in 1787, was abandoned by 1840, but traces of it still exist below the surface. Through archaeological survey, the students of Indiana University of Pennsylvania increased their knowledge and understanding of Newport, and more specifically, two of its roadways. The project attempted to answer three research questions that pertained to the roads of Newport: 1) Can it be determined if the current landscape feature that traverses north to south is the remnants of a nineteenth-century public road? 2) If the feature is a road, can the location of Newport Road be determined in relation to the first road? 3) If both roads have a clear definition, are the roads contemporaneous to each other and the town, and what are the potential ages of both? Analysis of the material culture that was recovered during the excavation and of the penetrometer data indicated that two separate roads were located during the excavation.

Kovacevich, Brigitte (University of Central Florida)

[20]

Discussant

Kovacevich, Brigitte [54] see Callaghan, Michael

Kovacevich, Brigitte [39] see Crawford, Dawn

Kovacevich, Brigitte [5] see Waite, Danielle

Kowalski, Jessica [222] see Nelson, Erin

Kracht, Emily [196] see Bloch, Lindsay

Krasinski, Kathryn (Adelphi University), Charles Holmes (University of Alaska, Fairbanks) and Barbara Crass (University of Alaska, Fairbanks)

[82]

Fourteen Thousand Years of Food Preparation at Swan Point, Tanana Valley, Alaska

Evidence of past meals offer specific information useful for reconstructing site function, paleo diets, and strategies for adapting to changing food landscapes. A zooarchaeological analysis identified species utilization, skeletal element representation, degree of fragmentation and burning to reconstruct 14,000 years of meal preparation at Swan Point. Adaptive strategies were employed following mammoth, horse, elk, and bison extinctions went extinct in the valley. Small mammals became increasingly important in the late Holocene and abundant gastroliths indicate birds were consistently hunted throughout prehistory at Swan Point. Butchering techniques, along with material culture traits, lend support to the premise that indigenous Athabascans were present throughout the late Holocene occupation and into the modern Euroamerican period.

Krasinski, Kathryn [82] see Holt, Evan

Krasinski, Kathryn [184] see Tullo, Dominic

Krasinski, Kathryn [82] see Wygal, Brian

Kraus, Geneva and Joanne Goodsell

[256]

Exploring the Effects of Operational Changes on Archaeological Sites at Folsom Lake, California

Dam construction causes direct and immediate impacts to archaeological sites from heavy machinery, blasting, and other activities; the formation of the artificial lake causes additional effects diffused across time and space. Numerous studies have considered the impact of erosion, deposition, vandalism and other factors on sites as a result of inundation and dam operations, but few studies have addressed how changes in operational regimes can exacerbate or reduce those effects. This question is directly pertinent to the federal obligation to identify, quantify, and assess these effects for National Historic Preservation Act (NHPA) compliance. The U.S. Army Corps of Engineers, Sacramento District, recently implemented a new Water Control Manual to guide the seasonal flood control operation of Folsom Dam, located 20 miles northeast of Sacramento. Operational changes can potentially intensify impacts to sites in the reservoir that are already affected by dam construction and past operations. Cultural Resources and Engineering staff created a model of hypothesized reservoir levels and releases under then-current and new operations to identify areas that would experience increased inundation frequency. This paper describes how the Corps identified effects, streamlined the NHPA compliance process, and built a mitigation program to explore changing operations and future effects.

Krause, Johannes [244] see Ferraz da Silva, Tiago

Krause, Johannes [173] see Naegele, Kathrin

Krause, Samantha (Texas State University), Timothy Beach (University of Texas, Austin), Sheryl Luzzadder-Beach (University of Texas, Austin), Emely Hernandez (Sewanee University of the South) and Eleanor Harrison-Buck (University of New Hampshire)

[14]

Geoarchaeological Investigations of Wetlands and Waterways in Crooked Tree, Belize

The lagoon system around the island of Crooked Tree in northern Belize provides a compelling hydrological landscape with a strongly seasonal flood regime. The area also presents evidence of long occupation and use by the Maya. Ongoing investigations include geoarchaeological testing within a series of linear cultural features throughout the Western Lagoon. In addition, we conducted sediment coring within nearby perennial marshes. The linear canal features within the lagoon, first reported by Pyburn in 2003, and later expanded on by Harrison-Buck in 2014, extend 600–800m east-west across the lagoon and may have served to regulate annual floodwaters in the system. This system holds research promise for a variety of reasons, and may help to answer questions regarding Maya landscape modification, hydrological engineering, subsistence strategies, and cultural resilience/response to environmental changes. Here we present preliminary geochemical, paleoecological and chronological results from the 2019 field season from wetland coring and key test excavations in the canal features of the Western Lagoon. Results from our ongoing analyses will provide robust information on hydrologic and geographic landscape patterns as well as human use of wetlands during cultural transitions.

Krause, Samantha [59] see Beach, Timothy

Krause, Samantha [14] see Flanagan, Kelin

Krause, Samantha [206] see Luzzadder-Beach, Sheryl

Kreutzer, Daniel (Metropolitan State University)

[239]

From Hacenderos to Smallholders: Cultural Conflicts between Anglo Colonists and the Mexican Government on the Nineteenth-Century Texas Frontier

When the Mexican government opened Texas to settlement by foreigners during the early nineteenth century, Mexico's expectation was that these colonists would use the generous allotments of land that were provided to them to help to expand the system of self-sustaining haciendas that had allowed Spain to develop and control much of Mexico. However, those Anglos who had emigrated from the United States were entirely unfamiliar with this system, which neither the Mexican government nor the empresarios who brought them to Texas ever adequately explained to them. Instead, the colonists established the smaller family farms that were culturally more familiar to them. Despite the Mexican government's attempts to integrate foreign colonists into Mexican culture through legislation, Mexico's inability to enforce these laws allowed Anglos to maintain their cultural connections with the United States. This lack of acculturation by the colonists was a major factor in the build up toward rebellion against their host country and their eventual declaration of Texas as a sovereign nation.

Krigbaum, John (University of Florida)

[153]

Discussant

Krigbaum, John [159] see Briggs, Emily

Krigbaum, John [240] see Fry, Megan

Krigbaum, John [150] see Kate, Emily

Krigbaum, John [80] see Williamson, Kylie

Krigbaum, John [35] see Zavodny, Emily

Kriss, Dawn [258] see DeLeonardis, Lisa

Krug, Andrew (University of Oklahoma), John Carpenter (INAH-Sonora), Guadalupe Sánchez-Miranda (INAH-Sonora) and Matthew Pailles (University of Oklahoma)

[79]

Multiculturalism in the International Four Corners: Recent Excavations in the Fronteras Valley, Sonora, Mexico

Archaeologists have explored migration and the consequences of population aggregation throughout the North American Southwest. The International Four Corners—the common borders of Arizona, New Mexico, Sonora, and Chihuahua—offers a unique setting to study the emergence of multiculturalism in the late pre- and proto-Contact period. Recent excavations by the Proyecto Arqueológico de Sahuaripa y Sierra Central, a joint field project between INAH-Sonora and the University of Oklahoma, revealed the juxtaposition of Casas Grandes and Rio Sonora sites in the Fronteras Valley of Sonora, Mexico. We propose the emergence of multicultural practices, as indicated by polychrome and textured ceramics, copper artifacts, and pueblo and rancharía architecture. We demonstrate multiculturalism by comparing recent archaeological data from the Fronteras Valley to previous research in the Animas, Bavispe, and Moctezuma Valleys. These shared practices may reflect the social and political reorganization in Northwest Mexico following the collapse of Paquimé in the fifteenth century.

Krupa, Krystiana (Indiana University Bloomington)**[49]***Ancestors Cannot Give Consent: The Need for Consultation in Ancient DNA*

Ethical issues in ancient DNA (aDNA) have slowly been gaining attention in scholarly and public media. Concerns about data interpretation, sampling methods, and consultation with descendant communities are just a few of those often highlighted. NAGPRA does not prohibit research on archaeological collections held by institutions, but academics and tribal nations alike are pushing for the necessity of consent from descendant communities for these types of projects. aDNA, like other specializations within anthropology, has historically excluded tribal members in the research design process—where consultation should begin—and often tribes are completely unaware of research projects until the data are published. Research involving ancestors should require consent from their descendants. This presentation shares examples of aDNA research collaborations done both poorly and well, and suggests strategies for building collaborative projects between academic institutions and tribal or other descendant communities.

[49]

Chair

Krupa, Krystiana [49] see Thomas, Jayne-Leigh

Krus, Anthony (University of South Dakota), Timothy Rieth (International Archaeological Research Institute), Derek Hamilton (University of Glasgow SUERC Radiocarbon Dating Lab) and Robert DiNapoli (University of Oregon)**[135]***Multiscalar Island Colonization Estimates through Bayesian Calibration Models*

Archaeologically, island colonization may be estimated at different geographical and temporal scales. Whereas behaviorally, colonization is a single landfall event, identifying the location of this initial landing in the archaeological record is not always possible due to site preservation, taphonomic, and sampling issues. Further, unambiguously confirming a particular site as the colonization area is often problematic. Bayesian calibration modeling provides a means to develop colonization estimates at site-, valley-, region-, island-, and archipelago-scales. Such a multiscalar approach allows the development of multiple hypotheses on the temporal and spatial dimensions of colonization, and the evaluation of different models offers sensitivity analysis for the overall approach. We present estimates for the Polynesian colonization of the Hawaiian Islands to illustrate this method.

[135]

Chair

Kruse, Andrea (University of Nebraska, Lincoln)**[236]***Tool Analysis of the Spring Creek Site (25FT31), an Early Archaic Site on the Great Plains*

The few Early Archaic sites within the Great Plains that have been excavated have been minimally studied. The Spring Creek Site (25FT31) located in southwestern Nebraska has now been more fully documented through my own evaluation of flaked stone tools, ground stone, and debitage, which complements the thorough analysis of faunal remains conducted in the 2000s by Widga. I have analyzed the lithic assemblage from the Spring Creek site in order to better understand the role of the site across the Plains landscape during the Early Archaic. I have previously suggested the site functioned as a base camp (Kruse 2019). This presentation will present the methods used to complete the tool analysis, along with the low power use-wear technique used to better analyze the artifacts. In this presentation I demonstrate how the lithic tool assemblage from Spring Creek provides insights into the Plains landscape during the Early Archaic, and I identify patterns that might have been taking place within the Great Plains during the Middle Holocene.

Kuckelman, Kristin (Crow Canyon Archaeological Center)**[131]***Seminal Research on Ancestral Pueblo Violence in the Northern Southwest*

Although violence among ancestral Pueblo peoples of the northern Southwest was proposed by Euro-Americans as early as the late 1800s, compelling evidence of such interaction was not recognized in the bioarchaeological record and in associated archaeological contextual data until the 1990s. In the past 25 years, Debra Martin's recognition and meticulous documentation of perimortem trauma and other human-caused damage on ancestral Pueblo remains, as well as Martin's collaborative, innovative, interdisciplinary study and interpretation of the occurrence and significance of violent events in the northern Southwest, permanently and fundamentally altered our understanding of the mosaic of Pueblo prehistory.

Kuennen, Kathryn (University of Iowa)**[63]***What's Deer to You? Exploitation of White-Tailed Deer from a Late Woodland River Valley Site*

Woodpecker Cave (13JH202) is a Middle to Late Woodland rockshelter site located in southeast Iowa. It served as the location for The University of Iowa's Archaeological Field School from 2012–2018. Seven seasons of excavations has resulted in over 24,000 faunal specimens. These faunal remains were sorted by element and assigned their appropriate genus and species. Care was also given to identify evidence of butchery, including cut marks and breakage morphology. Although over 30 species have been identified from Woodpecker Cave, the quantification analysis indicated that subsistence efforts were focused primarily on the hunting of white-tailed deer (*Odocoileus virginianus*). Woodpecker Cave has three clear layers of occupation. Previous seasonality analyses of the most recent layer have indicated that Woodpecker Cave was occupied in the winter, and further analyses of the remaining layers will evaluate whether the seasonality is the same as the later the occupations.

Kuijt, Ian (University of Notre Dame) and Arkadiusz Marciniak (Adam Mickiewicz University, Poznan, Poland)**[199]***How Many People Lived in Early Villages? Reconsidering Neolithic Demography at Çatalhöyük*

Archaeologists have divergent options as to how many people lived at different Neolithic villages. Near Eastern Neolithic settlements have been historically interpreted as being occupied by thousands of people. This interpretation is founded on several observations: that excavations at settlements often reveal the remains of the densely packed mud-brick buildings, at times with buildings being reconstructed multiple times, and that settlements are defined by deep stratigraphic deposits with some degree of continued use. The frequency and tight packing of buildings is of course familiar to archaeologists living today, for both visually and spatially this pattern echo's our personal experiences within urban contexts of confined space, restricted access, and bounded social worlds. The most contesting issue at Neolithic villages, however, is how to best estimate population levels, and how long people lived in individual buildings. Revisiting the hitherto dominant picture of the mound occupation and employing the Bayesian modeled estimates of the length of individual house use, we argue that any one time between 1,000 and 1,200 people were living on the mound of Çatalhöyük rather than by 3,500 to 8,000 people, as proposed by Cessford (2001). The evolutionary development of Neolithic villages is reconsidered vis-à-vis these revised estimates.

Kulaga, Nicole (California State University, Northridge)**[236]***Interpreting Settlement and Mobility Patterns of Terminal Pleistocene and Early Holocene Archaeological Sites on Santa Rosa Island, California*

The Northern Channel Islands off the coast of southern California have played a pivotal role in understanding some of the earliest archaeology in North America, going back at least 13,000 years. Together, the islands of Anacapa, Santa Cruz, Santa Rosa, and San Miguel have one of the highest density of Late Pleistocene and Early Holocene aged archaeological sites. While the Paleocoastal archaeology has been the target of much research, there are still many aspects which have not been thoroughly explored, including settlement and mobility patterns of Paleocoastal peoples. This research interprets these patterns after conducting an intensive artifact analysis on arguably one of the most intensively excavated Paleocoastal sites, CA-SRI-997 on Santa Rosa Island, and comparing the results to other contemporary Late Pleistocene and Early Holocene sites on the islands. The collected data was compared to well-known settlement and mobility hunter-gatherer models. The results of this research will be able to inform archaeologists about different aspects of one of the earliest cultures in North America, including site function, site organization, and settlement and mobility patterns.

Kulick, Rachel (University of Toronto), Kevin Fisher (University of British Columbia) and Francesco Berna (Simon Fraser University)**[263]***Geoarchaeology of Terraces and Building XVI at Kalavassos-Ayios Dhimitrios, Cyprus: Evidence for Site Formation and Settlement Activity*

Geoarchaeological research conducted in 2019 as part of the Kalavassos and Maroni Built Environments (KAMBE) project focused on collecting multiscalar and high-resolution geoarchaeological data from the Late Bronze Age city of Kalavassos-Ayios Dhimitrios in south-central Cyprus. The aim of the geoarchaeological project is to determine the uses of space in and around the city's structures and activity areas as well as to connect site formation processes with social activities and environmental transformations occurring in the surrounding landscape. This paper discusses the results from two key aspects of this geoarchaeological research: (1) the investigation and coring of field terrace systems surrounding the site, and (2) the thin section micromorphological analyses of floor context samples from Building XVI. The results demonstrate how multiscalar, high-resolution geoarchaeological and environmental data, examined in conjunction with archaeological contexts revealed by ongoing and previous excavations, can contribute to understanding the structure and transformation of this major urban center in its broader socio-environmental landscape.

Kumm, Ethan, John Dudgeon (Camas, Idaho State University) and Amy Commendador (Idaho Museum of Natural History)**[236]***Obsidian Utilization in the Snake River Plain, Southern Idaho: The Dean Site and Its Importance for Understanding Lithic Procurement Strategies in the Northern Great Basin*

There are numerous archaeological sites on and adjacent the Snake River Plain (SNP) in southern Idaho. Artifact catalogs include utilized flakes, debitage, broken points, and intact points. Owing to the SNP's volcanic history, many artifacts are made from obsidian, and over two dozen geographically restricted obsidian sources were utilized prehistorically. SNP obsidian sourcing studies are primary data for archaeological research questions including mobility patterns, use-frequency of different obsidians, and material preference. This study focuses on material from the Dean site (10TF01), a long-term occupation site in Twin Falls County, southern Idaho. Previously described as a hunting and tool manufacture site, numerous lithics have been previously excavated or surface collected and are curated in the Earl Swanson Archaeological Repository, Idaho Museum of Natural History. A total of 392 obsidian projectile points were analyzed by portable XRF and compared with elemental data on artifacts and obsidian sources performed with LA-ICP-MS. We perform sourcing analysis to determine which sources were being used at the Dean site and if any observable preferences in obsidian utilization occurred through time. Our results show that local obsidian was primary, but obsidian from more distant sources was also utilized at the Dean site.

Künne, Martin [189] see Costa, Philippe

Kupsch, Mary**[99]***Soul Concepts of Postcolonial Woodland and Plains Indians: A Systematic Survey of Specific Ideas in Oral Narratives as a Foundation for an Archaeology of Souls*

The potential for accurately and more fully reconstructing prehistoric Woodland and Plains Indian societies' notions of human soul-like essences using symbolically rich mortuary remains and art can be improved when analogous, comparative ethnohistorical information is collected systematically and with sensitivity to tribal and regional variations. Literature on 49 historic Woodland-Plains tribes from nine language families produced 643 cases informing on nine subjects, five reported here: the number and locations of souls in an individual, the number of souls that leave the body in life and death, and where and when soul(s) exit. Three geographic areas are compared for the ideas of their tribes: the Northeastern Woodlands, the Southeastern Woodlands, and the Plains. Ideas varied considerably but patterned in their frequencies and geographic distributions. For example, the number of souls an individual was thought to have varied from one to four, and these differed in where they were thought to reside among nine bodily locations. Five distinct bodily locations were held to be where souls exited the body at death. Their times of departure differed from before death to much later or never. The data show that researchers cannot apply historic analogies from one region to archaeological remains in another.

Kurin, Danielle [224] see Black, Valda

Kurnick, Sarah (University of Colorado, Boulder)**[46]***How Marginalized Voices Are Rewriting History*

It is common for outsiders to depict the history and culture of marginalized groups, and often in a manner that sustains, rather than challenges, inequality. If you fly into Cancun and head south, for example, you pass through the Maya Riviera. You can stay in Maya-themed hotels, eat at Maya-themed restaurants, and shop in Maya-themed stores. You can even spend the day at Maya-themed amusement parks, some of which are named after, and located next to, archaeological sites. But, contemporary Maya peoples—of which there are approximately seven million—generally have no say in how Maya history and culture are represented to tourists and do not benefit financially from this lucrative tourism industry. What if Maya and other marginalized groups presented their own histories and cultures to outsiders, including tourists? What effects might such self-representation have? And, how might it challenge our understanding of the present and change our perception of the past?

[46]*Chair*

Kuruçayirli, Emre [175] see Martin, Samuel

Kuzminsky, Susan [172] see Domeischel, Jenna

Kwoka, Joshua (University at Buffalo) and Thomas Guderjan (University of Texas, Tyler)**[230]***Lidar and the Longue Durée in Northwestern Belize*

For at least 3,500 years, societies from across the sociopolitical spectrum have called northwestern Belize home. The footprints of these occupations are not uniform due to variation in population levels, technology, and environmental worldviews. In 2016, this panoply of human-environment interactions was recorded in a single day by a 40 km² lidar survey centered on the ancient Maya site of Xnoha. Shortly thereafter, a digital survey of archaeological resources was initiated that quickly expanded to include historical and contemporary land use data. This paper details preliminary results of these efforts with an emphasis on the impact of lidar data within three domains. First, how has the lidar data impacted established regional models of ancient Maya settlement patterns, land use, and population dynamics? Second, what can be learned about contemporary and future (i.e., planned) land use, particularly in relation to deforestation? And third, to what extent do contemporary agricultural practices impact the visibility of archaeological features? These topics will be accompanied by a description of methods, including the utility of multiple raster visualizations.

Kwoka, Joshua [230] see Guderjan, Thomas

Kyaw, Pyiet Phyo [28] see Iannone, Gyles

La Rocca, Luigi [104] see Chiffi, Maria

LaBelle, Jason (Colorado State University)**[68]***Lindenmeier's Neighborhood: Folsom Site Distribution among the Foothills of Northern Colorado*

Base camps such as the Lindenmeier Folsom site (5LR13) of northern Colorado likely served as the focal point of a regional settlement system. It follows then that there should be additional small camps and bison kills scattered throughout the surrounding area. Archaeologists have documented at least a dozen Folsom find spots (points, preforms, and/or channel flakes) from Larimer County, gathered from site records, museum and private collections, and recent fieldwork. Few are in close spatial association with

Lindenmeier. However, the locales are distributed nearly exclusively within the foothills, which is a relatively small area within a region containing diverse ecosystems (short grass plains to alpine tundra) and with elevations ranging over 2300 m in vertical relief. This presentation critically reviews the dataset and assesses what the distribution might say about Folsom settlement systems, or instead about issues related to exposure of late Pleistocene surfaces.

Labrada-Ochoa, Marcos Octavio [257] see Castro-Priego, Manuel

Ladefoged, Thegn (University of Auckland), Rod Wallace (University of Auckland), Alex Jorgensen (University of Auckland), Paul Augustinus (University of Auckland) and Matthew Prebble (Australian National University)
[124]

Gardening and Niche Construction at Waitetoke, Ahuahu (Great Mercury Island), New Zealand

Polynesian settlers of Aotearoa New Zealand faced a serious challenge adapting their tropical horticultural systems to Aotearoa's temperate conditions. Initial settlers were drawn to Ahuahu, a small offshore island, from the early fourteenth century in part by its warm microclimate and the relative ease with which the native forest could be cleared and transformed into a productive horticultural landscape. At Waitetoke on Ahuahu our ongoing archaeological, geophysical and palaeo-ecological research has documented the transformation of the area from virgin native forest to a raised bed taro complex, and later to an intensified sweet potato garden. The taro complex included a series of channels and check dams that directed water within the small drainage and from a nearby spring, and had anthropogenic soils that were deliberately constructed by bringing in topsoil and incorporating charcoal, shell midden and rock to improve soil texture and fertility. The presence of taro pollen in these soils suggests perennial production to maximise corn size. The later sweet potato garden was defined by surface rock alignments demarking cultivation plot boundaries with gardening layers containing sweet potato starch granules. We present the results of recent research and future plans to document the ecodynamics of Māori horticultural strategies.

Ladefoged, Thegn [262] see Johnson, Adam

Ladefoged, Thegn [124] see McCoy, Mark

Ladrón de Guevara, Sara [191] see Bernard, Henri

Ladrón de Guevara, Sara [227] see Budar, Lourdes

Laguer-Díaz, Carmen [271] see Pestle, William

Lahaye, Christelle [36] see Holliday, Trenton

Lai, Celine

[94]

Shang Perspectives for Animals: Evidence from Archaeological and Inscriptional Records

Relationships between human and animals vary in different cultures. The Shang treated animals with both awe and a sense of superiority. The Shang kings and his noble members presented many animal motifs on their bronze vessels, which were intended for presenting food and drink offerings during religious worships. But animals would not have been not as central and important as an imaginary beast they created—the taotie, about which we hardly know anything. The Shang's animal world was rather complicated and that has not been fully explored in light of their objects and written materials. The purpose of the paper gives an account of animal records as found in their visual culture, paired with an analysis of the inscriptional accounts regarding hunting, weather forecasts, and mentions of military booties as left by the Shang kings and his noble members on their fortune-telling devices.

Lain, Andrea [190] see Lothrop, Jonathan

Lalo Jacinto, Gabriel [54] see Paris, Elizabeth

Lalo Jacinto, Gabriel [203] see Williams, Megan

Laluk, Nicholas (Northern Arizona University) and Robert Preucel (Brown University)

[41]

Pragmatism in Native North American Archaeology

Archaeologists have recently discussed the possibilities of pragmatism within archaeological theory and practice. They hold that pragmatism links archaeology to meaningful social action and can in this way contribute to broader dialogues concerning the social challenges humanity faces at this point in its history. However, what is often left out in such discussions are its relevance to Native American and Indigenous experiences and perceptions. Native American communities have a deep history concerning many concepts found within Western pragmatic reasoning that have been their own since time immemorial. But how might we define an "Indigenous pragmatics"? What components from Indigenous epistemologies might lead us to better understandings of pragmatics? How might these insights contribute to contemporary Indigenous communities and the discipline of archaeology? This paper attempts to address these questions through our continuing research with Native American communities in the U.S. Southwest. We

think the answers to the questions contribute to a more democratic, inclusive, decolonial archaeology for the future. Moreover, such a focus contributes to dismantling and demystifying the foundations of the discipline through direct Indigenous experience and the intricate interweaving of Indigenous epistemologies that provide much needed social action to address community needs within Native North American contexts.

Laluk, Nicholas [184] see Castleberry, Cala

Lam, WengCheong (Chinese University of Hong Kong Department of Anthropology) and Shengqiang Luo (Chengzhou Municipal Museum)

[94]

Distribution and Supply Network of Bronze Mirrors in the Southern Frontiers of the Han Empire

Bronze mirrors have been widely found in Han tombs and were a major type of contemporary daily items. But it has not been systematically investigated how bronze mirrors were manufactured and supplied to various parts of the Han empire, especially in the southern frontiers of the Han empire in which the traffic system was still primitive. To address the issue mentioned above, this presentation collected bronze mirrors discovered in the southern Jinzhou and Lingnan regions. Through a statistical analysis of the types of bronze mirrors and a review of legacy data in previously published works, this presentation suggests that most bronze mirrors might have been manufactured in several centralized production centers outside the southern frontiers, while small-scale local manufacturing coping the products manufactured from the North co-existed at the same time. Also, the supply of bronze mirrors via inter-regional transportation was more sufficient in major centers regardless of the distance between those centers in the South and potential production workshops in the North, suggesting that a relatively integrated network existed in the Han empire. This new understanding may provide a piece of evidence enhancing our understanding about the "globalization" of material cultures occurred in the Han period.

Lambach, Toni [122] see Whisenhunt, Mary

Lambert, Shawn (Mississippi State University)

[166]

Iconographic and Organic Residue Evidence for Datura-Making in Central Arkansas River Valley

This paper presents research to identify Datura residues (a flowering plant with hallucinogenic properties) in late prehistoric composite bottles from the Central Arkansas River Valley. The bottles are incredibly unique because ceramic disks with a series of concentric perforations were incorporated into the bottles at the juncture of the bottle neck with the globular portion of the body. The organic residue analysis revealed that these bottles contained high concentrations of Datura. The internal clay disks likely served as strainers or filters, separating the psychoactive properties from the Datura flower to create a powerful liquid concoction.

[166]

Chair

Lambert, Shawn [47] see Ford, Paige

Lambert, Spencer (Southern Methodist University) and Mark McCoy (Southern Methodist University)

[262]

How to Catch Fish with a Digital Net: Creating a Geodatabase for Marine Fauna in the Hawaiian Islands

The remains of fish, shellfish, and other marine creatures are among the most common type of material recovered from archaeological sites on the islands of the Pacific. But, in the Hawaiian Islands, like other places, most marine faunal data are presently confined to gray literature or unpublished dissertations, with even more still awaiting analysis among museum collections. In this paper, we discuss a protocol for generating a comprehensive marine fauna geodatabase for coastal sites in the Kona and Kohala Districts of Hawai'i Island. Fish data was extracted from documents using optical character recognition and an open-source search application. Locational data was generated by georeferencing sites using maps from articles and reports. The distribution of recovered marine fauna is discussed relative to the coastal environment, the spatial distribution of fishponds, and the efficacy of data mining versus reanalysis of collections. We address several pitfalls encountered while obtaining usable data and offer some advice on how these complications can be avoided in future research.

[262]

Chair

Lambert, Spencer [148] see Bryce, Joseph

Lamie, Katherine (SDSHS Archaeological Research Center) and David Williams (SDSHS Archaeological Research Center)

[172]

Dusting Off "Legacy" Projects: Collaboration and Compromise to Complete 30-Year-Old Projects

Repository and contract managers have different priorities and funding structures, and while they share many legal and ethical concerns, it is sometimes difficult to balance their perspectives during complicated projects. At the South Dakota Archaeological Research Center, reports for several large-scale contract and outreach archaeological field projects that were initially conducted over the past 30 years have not been completed. Time, budget, and personnel constraints were all contributing factors to these "legacy" projects. Now, a powerful combination of renewed research interests, re-aligned priorities, upgraded project management policies, and a framework of support and collaboration has facilitated the completion of final excavation reports and collection processing tasks. The ARC Repository and Contracts Managers will discuss three main points: the factors that created legacy

projects, the plan to address them today, and how to avoid a backlog into the future. Importantly, completing legacy projects satisfies several legal and ethical requirements, allows for the sharing of professional results with federal, tribal, state, and academic stakeholders, and leads to better long-term curation solutions.

Lamothe, Michel [81] see Forget Brisson, Laurence

Lamoureux St-Hilaire, Maxime (Davidson College)

[93]

Moderator

Lamoureux St-Hilaire, Maxime (Davidson College)

[209]

Discussant

Landau, Kristin (Alma College)

[130]

The Dynamics of Maya State Process: An Integrated Perspective from the San Lucas Neighborhood of Copán, Honduras
Recognized as a UNESCO World Heritage Site, the ancient city of Copán was a major center of Maya settlement and ideology during the Classic Period (AD 250–900). While archaeologists have been traditionally concerned with Maya rulers and their top-down despotic power, I show how over Copán's history, infrastructural power—the ability of the state to affect the everyday lives of its residents—waxed and waned. The outlying urban neighborhood of San Lucas was remapped and excavated to accurately construct its dynamic life history. I focus on changes at four San Lucas households, attending to episodes of landscape engineering, architectural construction, and trends in material culture. I consider household and neighborhood changes together with royal political events recorded in hieroglyphic writing at Copán center. Such events show whether and which state policies altered the daily lives of city residents. By incorporating a bottom-up perspective from San Lucas, the intermediate scale of neighborhoods provides a balanced assessment of citywide political dynamics, autonomy, and power.

Landazuri, Heather (University of Maine, Orono) and Daniel Sandweiss (University of Maine, Orono)

[8]

New Kid on the Block: El Niño-Modoki in Peru, Past, Present, and Future

During the climatological phenomenon referred to as El Niño Modoki, warm sea surface temperatures (SSTs) in the central Pacific are flanked on the east and west by cooler SSTs. Over the last century, El Niño-Modoki has increased in frequency, but a long-term sequence has yet to be established prior to the last four centuries. At least on the north coast of Peru, El Niño-Modoki is associated with reduced river discharge resulting from lower precipitation and/or temperature in the adjacent Andes mountains. Much paleoclimatological and archaeological research has focused on the effects of canonical El Niño along the Peruvian coast, however, almost no attention has been paid to El Niño-Modoki in this region even though the associated reduction in water flow must have a major, recurring effect on the irrigation-based societies that inhabit the area. Considering the societal and environmental gravity of ENSO phenomena, improving our understanding of previous events is essential not only to anticipating them, but also to mitigating their effects on human populations. In this poster we present the paleoclimatological research potential of El Niño Modoki on the northern coast of Peru with specific focus on potential proxy sources, prehistoric adaptive strategies, and modern applications.

Landivar, Tamara [257] see Ordoñez, Maria

Landt, Matthew [147] see Johnen, Connor

Lane, Brian (University of Oregon)

[77]

Defining Human Territories: A Case from Rapa, East Polynesia

Competition as a human behavior is frequently studied in archaeology. Research often focuses on aspects of competition that are highly visible in the archaeological record such as violent conflict, often in regards to evidence for direct or indirect conflict and physical remains of fortifications. Despite the focus on conflict as an outcome of competition, there are other competitive behaviors that are also visible in the archaeological record such as differential degrees of interaction between adjacent groups through stylistic analysis of artifacts, the signaling behavior, and establishing of group territories, just to highlight a few. Despite the ongoing discourse concerning human competition, research often lacks measurable units to define or explain data, often relying on an absence/presence approach to the data. This research focuses on measurably defining territories of human groups on the island of Rapa, Austral Islands, French Polynesia. Rapa is often used as an example of human conflict in the Pacific due to the presence of more than a dozen fortified villages situated on the island's ridge line. The purpose of this poster is to highlight spatial analytical techniques that are intended to indicate specific territories associated with individual fortifications.

Lane, Brian [258] see Lentz, David L.

Lange, Frederick (Smithsonian Institution Department of Anthropology)**[126]***INAA Identification of Greater Nicoya's Ceramic Schools, Families, and Their Stability*

The author met Ron Bishop on a research outing in Guanacaste, Costa Rica in 1979. As a result of conversations during the research visit, the author selected approximately 100 Middle Polychrome (Mora Polychromes) samples from multiple sites on the Nicoya Peninsula (Guanacaste Province), Costa Rica. A high level of homogeneity among the analytical results presented two alternative interpretations (1) a single production site, source, or region, or (2) homogeneity resulting from similar volcanic-based clays. We realized that, in the case of homogeneous clays the ability to distinguish finite regional patterns would be greatly reduced. Therefore, we increased the sample to include all principal 38 types from the four major time in the Greater Nicoya sequence. The homogeneity observed in the Mora Polychrome suite was duplicated in the 37 additional suites from the four chronological divisions; by 1988 over 1,200 samples had been analyzed, with the established homogeneity for different types continually reinforced. Based on the confidence in the homogeneity of the elements of the sample, this author has developed models for long term stability in localized "schools" and the production by tightly knit families of potters with stability of production over as many as 1000 years.

Langford, Theresa [172] see Wilson, Douglas

Langis-Barsetti, Dominique [175] see Martin, Samuel

Langlais, Mathieu [30] see Sánchez de la Torre, Marta

Langlie, BrieAnna (Binghamton University), John Wilson (University of Arkansas), Jacob Frank (Binghamton University) and Matthew Chmura (Binghamton University)**[124]***Finding Terraces in the Lake Titicaca Basin, Peru*

Driving through the Lake Titicaca basin of southern Peru travelers are often struck by terrace covered hillsides rising from the plain. Nearly every hillside encountered has been transformed from steep faced rocky hillsides into arable land. These ancient fields were constructed and farmed millennia ago to help farmers adapt to the high-altitude, arid ecosystem, an ever-oscillating climate, and dynamic cultural regimes. However, very little is known about the extent of these terraces, when they were built, or who built them. The vast extent might be one of the reasons why terraces have not been systematically studied in the region. In this paper, we discuss producing an integrative GIS database to 1) locate and examine the extent of agricultural terrace complexes; 2) associate terrace complexes with known archaeological sites; and 3) characterize terrace typologies as visible from satellite data. Remote sensing allows us to quantify and characterize terraces in a way that is not possible from terrestrial survey methods.

Langlie, BrieAnna [180] see Chen, Jennifer

Langlie, BrieAnna [61] see Folk, Maureen

Langston, Jada (Hamilton College), Colin Quinn (Hamilton College), Lacey Carpenter (Hamilton College) and Horia Ciugudean (Muzeul National al Unirii Alba Iulia)**[35]***Interaction, Integration, and Inequality: Geospatial Analyses of Bronze Age Settlement Networks in Southwestern Transylvania*

The Bronze Age (2700–1500 BCE) was a time of unprecedented scales of social interaction, integration, and inequality in Transylvania. Geographic Information Systems (GIS) and spatial analysis techniques continue to increase our understanding of socio-economic institutions, such as trade and labor, and interregional connections. In this poster, we present the results of GIS and network analyses designed to examine how the organization of metal procurement, trade, and mobilizing labor structured settlement networks in Bronze Age Southwestern Transylvania. We present multiple ways of reconstructing Transylvanian social networks and test these geospatial models using archaeological survey data. Our results demonstrate that the development of institutionalized inequality with elite control of economic production occurred in fits and starts. This case study contributes to our broader understanding of the relationship between interaction and inequality in the past.

Lanier, Hayley [244] see Rayfield, Kristen

Lanoë, François (University of Arizona), Joshua Reuther (University of Alaska Museum of the North), Charles Holmes (University of Alaska, Fairbanks), Ripan Malhi (University of Illinois, Urbana-Champaign) and Ben Potter (University of Alaska, Fairbanks)**[82]***Late Pleistocene Large Canids (Dog/Wolf) at Archaeological Sites of the Middle Tanana Valley, Alaska*

Large canid remains are a rare occurrence in Late Pleistocene archaeological sites throughout Beringia and the Americas. Their significance stems in their potential to help understand human-canid relationships at that time, particularly issues related to (1) dog domestication and (2) the ecological impact of human hunting on ecosystems and associated megafauna. Here we report the recent discovery and/or analysis of large canid remains at the sites of Swan Point, Broken Mammoth, and Hollembaek's Hill, in the middle Tanana valley of central Alaska. Large canid remains at these sites date to 14,000–12,000 cal BP; one of them may have been buried intentionally within the archaeological occupation. Ongoing and future excavations, zooarchaeological, and DNA analyses will clarify the

archaeological context of these specimens, their taxonomic affiliation, and their potential to inform current archaeological and paleontological debates.

Lanoë, François [82] see Kielhofer, Jennifer

Lanoë, François [23] see Zedeño, María Nieves

Lanos, Philippe (CNRS (IRAMAT-CRP2A)) and Philippe Dufresne (CNRS (IRAMAT-CRP2A))

[24]

A New Bayesian Approach for Estimating Chronological Events and Phases with ChronoModel

Many issues in archaeology concern the issue of phasing—the beginning, end and duration of a given period. We define a “Phase” as a group of Events (Event dates) that share common features. Currently used Phase models implemented in many software packages employ statistical models that concentrate posterior Event dates. Alternatively, we introduce a new statistical definition for “Phase,” which does not require additional parameters (Phase boundaries) and is based directly on the Event model—a new, robust Bayesian statistical model combining contemporaneous dates, stratigraphic constraints, and the temporal ordering of phases that will act on Event dates. A posteriori, the beginning, end and duration of a Phase are estimated from posterior Event dates using MCMC techniques. Moreover, we introduce a new means for characterizing the temporal characteristics of Phases via calculations of their time range, gap range and transition range at a given confidence level. Furthermore, this framework allows one to calculate the cumulative frequency of archaeological events (e.g., 14C measurements) within a given Phase, and these tempo plot trajectory curves illustrate the mean number of dated events prior to a given date within a Phase. The Bayesian statistical methods described above are implemented in the ChronoModel software package.

Lanos, Philippe [24] see Banks, William

Lapp, Jennifer

[154]

Moderator

Laqualia, Jennifer (Fort Huachuca Cultural Resource Specialist)

[214]

Through the Looking Glass: Glass Bottle Typology and Analysis on Historic Fort Huachuca

Fort Huachuca is one of the oldest military posts in the country. From the infamous 10th Cavalry “Buffalo Soldiers,” to the 40th Signal Battalion, to civilian ranchers, to the Apache Scouts, Fort Huachuca has been home since the late 1800s to many on this harsh but beautiful landscape. We can see this rich history through the thousands of artifacts littered across the post. This poster will look at historic glass bottles, both military and civilian, that have been recorded and collected on Fort Huachuca by post archaeologists. I have collected and analyzed various glass bottles from several different sites that show various occupations over a 100+ year time period to create a glass bottle typology for use in future analysis. I will highlight this typology and how we can understand Fort Huachuca and southern Arizona on a deeper level.

Larios, Jennifer (University of Michigan), Jacob Bongers (University of East Anglia), Jordan Dalton (University of Michigan), Jo Osborn (University of Michigan) and Camille Weinberg (University of Texas, Austin)

[21]

The Pottery of Chincha Revisited

Recent studies on the late prehispanic periods in the Chincha Valley, Peru have enabled scholars to obtain a better understanding of the Chincha Kingdom. However, the pottery produced in the Chincha Valley during the Late Intermediate Period and Late Horizon has received little attention since Dorothy Menzel’s critical studies in the 1960s. This study aims to expand our knowledge of Chincha ceramics by revisiting recent analyses on a sample of Chincha pottery that spans various contexts and numerous sites throughout the Chincha Valley.

Larkin, Karin (University of Colorado, Colorado Springs)

[154]

Discussant

Larkin, Karin (University of Colorado, Colorado Springs) and Michelle Slaughter (Alpine Archaeological Consultants)

[214]

Happy Trails and Speakeasies: The Archaeology of a Tuberculosis Sanatorium

Colorado Springs enjoyed a world-wide reputation as a health mecca for consumptives during the first half of the twentieth century. Starting around the 1890s, tuberculosis sanatoriums began to spring up all along the outskirts of town. Cragmor was one of the premier sanatoriums built in the city renowned for its healing climate. In its heyday, Cragmor housed some of the wealthiest patients in the United States. Today, this material culture is buried under the growing campus of the University of Colorado at Colorado Springs. As part of a survey and inventory of the cultural resources of UCCS funded by the Colorado State Historical Fund, we identified and recorded several sites associated with the original functioning of the sanatorium. 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. Using archaeological testing and historical records, we illuminate institutional practices and occupants, as well as describe identifying alternative healing strategies employed by physicians and patients at Cragmor.

Larrick, Dakota (University of Oklahoma)**[66]***A Landscape Approach to the Late Paleoindian Bull Creek Camp, Oklahoma Panhandle*

Radiocarbon dates and other lines of evidence from two sites on the Southern Plains, Bull Creek, an open air camp, and Ravenscroft, a nearby large-scale bison hunting locale, point to their correlation and contemporaneity during the late Paleoindian period. This poster will synthesize the conclusions reached through various methods of analysis at both sites including paleoenvironmental reconstruction, lithic analysis, and faunal analysis into a reconstruction of natural resource uses within and around the Bull Creek valley landscape by groups there during the late Paleoindian period. Such groups appear to have lived in the valley during at least the late summer / early fall and winter and consumed animal resources differentially depending upon the season. The camp site's location on a terrace overlooking Bull Creek is indicative of the group's need for a nearby water source as well as the fauna which water sources support: predominantly bison during the winter, which were hunted en masse through use of the creek's adjacent arroyos, and a more diverse array of species during warmer months. Sourcing the lithic materials used for projectile points and other tools suggests a territorial range throughout the year spanning at least 160 km due west and south.

Larrick, Dakota [103] see Ballenger, Jesse

Larsen, Andrew and Jim Railey (SWCA Environmental Consultants)**[177]***Projectile Point Frequencies as Climatic Indicators*

Climatic conditions in the arid U.S. Southwest have been variable long before human induced climate change, particularly with respect to rainfall and by extension the presence of surface water. This poster considers past climatic changes through the lens of available surface water by examining projectile point temporal and spatial distribution within a 6000-acre study area located in west central New Mexico. The study area has a large, and temporally varied, number of projectile points (n=84) spanning from the Paleoindian to Late Formative periods. The study area sees a spike in temporally diagnostic projectile points in the Middle and Late Archaic periods, totaling 63.6% of the assemblage. This time period corresponds to the previously defined Late Holocene Wet Period (2500 BC—AD 900). Thus, we offer that projectile point data from the study area supports previous tree ring, pollen and geomorphic studies that indicate a period of relative wetness and increased human activity on the landscape. We also consider how the spatial distribution of projectile points may assist future researchers studying climate change in other arid regions.

Larson, Kara (Mississippi State University)**[234]***Meat on the Hoof: A Zooarchaeological Isotopic Investigation into Administrative and Cultic Herd Management at Khirbet Summeily*

Khirbet Summeily is an Iron Age II site located northwest of Tell el-Hesi in Southern Israel. Excavations conducted by Mississippi State University have revealed a large, singular structure with an adjoining ritual space dated to the Iron Age IIA. Recent interpretations suggest the site was integrated into a regional economic and political system and functioned as a potential administrative outpost based on the material culture and architecture recovered from the Iron Age IIA layers. This paper presents the carbon, oxygen, and strontium isotopic analyses of intra-tooth samples from ovicaprine and cattle remains to test herd management strategies in connection to administrative provisioning activities. The animal remains are used as proxies to identify political and economic ties through shared foodways and herd management patterns. The results provide information addressing herd management and mobility patterns as well as the level and identity of the larger political network the site was integrated into, thereby testing the hypothesis that Khirbet Summeily was an administrative outpost.

[234]*Chair*

Larson, Kara [180] see Miller, D. Shane

Larson, Mary Lou (University of Wyoming) and Marcel Kornfeld (Paleoindian Research Lab, UW)**[103]***Hell Gap and Its Changing Roles*

Hell Gap site excavations began in 1959; however, the bulk of the investigations occurred between 1962 and 1966. This was early in Ruthann Knudson's archaeological career, but the site left a lasting impression on her, as it did on others, and she returned to write a chapter in the first monograph on Hell Gap. The second round of investigations began in the early 1990s with a substantially different focus. Rather than chronostratigraphy, which remained an important question, the focus shifted to site formation, site structure, and the myriad of questions on subsistence, mobility, and technology. In this presentation we focus on the recent results.

[103]*Chair*

Larson, Mary Lou [103] see Kornfeld, Marcel

LaRue, Chuck [69] see Whittaker, John

Lash, Heather**[241]***Foodways of Pre- and Post-Emancipation African Americans at James Madison's Montpelier: A Zooarchaeological Analysis of Food Preference and Food Access*

Through the production, preparation, and consumption of food, individuals create and reconstruct their worldview in relation to their personal identity and expression of self. Therefore, the agency of enslaved and formerly enslaved individuals can be reconstructed through an exploration into factors influencing food preference. The relationship between preference and access is evaluated in the way exchange is facilitated within three African American communities, and one family, at James Madison's main house, Montpelier (1764–1844). Through zooarchaeological analysis of faunal materials from four contexts at Montpelier, agency and personal preference in food can be examined.

Lash, Ryan (University of Notre Dame)

[272]

Cult and Cultivation: Vulnerability and Resilience on Inishark Island, Co. Galway, Ireland, in the Nineteenth Century

Critics of new materialist approaches in archaeology caution that focus on the active qualities of materials and the distributed agency of assemblages obscures the cruelties of inequality that allow the powerful to do as they will and others to suffer what they must. Confronting this critique, this paper examines the famines in nineteenth-century Ireland as a political ecological catastrophe about which an assessment of the role of human (landlords, government officials, tenant farmers) and non-human actors ('the blight', the lumper potato, marginal landscapes) carries considerable political stakes. Drawing upon archaeological and archival data from the island of Inishark, I suggest that attending to the subsistence, sensory, and mnemonic affordances of diverse materials in the landscape actually highlights islanders' creative agency in maintaining collective identity, action, and livelihood in the midst of adversity. I argue that islanders' curation of medieval ritual monuments and annual commensal celebrations associated with the cult of Saint Leo generated a shared heritage that reinforced social bonds required by their community's collective agricultural regime. New materialist approaches can therefore nuance understandings of vulnerability and resilience by exploring how humans operate within material assemblages that afford and constrain patterns of subsistence, lived-experience, and social affinity and difference.

Lash, Samantha

[59]

The Mercurial Mosaic: Local Realities and Climate Change in the Mediterranean

Both environmental reconstruction and analysis of human responses to, and effect on, environmental circumstances require a fine-grained, localized, and contextualized approach to produce high precision information. This is distinct from climatic and environmental research that typically relies on distant proxies, which provide necessarily broad descriptions of large-scale trends. Archaeologists employ many concepts when attempting to document how humans modify the landscape, adapt to change, and how such changes relate to broader socio-political-economic realities. Just as the ideological and situational relationship between humans and their environment must be addressed, so to must issues of spatial and temporal scale in data to reconcile disparate frameworks traditionally divided by disciplinary boundaries. In the case of the Mediterranean, its intensely varied landscape and complex climate dynamics hardly merits its classification as a region to some, while to others, it defines it. Large-scale and long-term claims about the Mediterranean environment lack clarity, resolution, and accuracy. This paper promotes a distinctive archaeological approach to the study of climate change: the reconstruction of inferred ancient climate change in the Mediterranean through local signals (lipid biomarkers found in animal bones) and its distributive agency in the cultural negotiations that transformed the rural countryside in the first millennium BCE.

Lassen, Robert (AmaTerra Environmental Inc.), Brittany McClain (AmaTerra Environmental Inc.) and Timothy Griffith (AmaTerra Environmental Inc.)

[194]

Excavations at the Crane Dune Site (41CR61), a Prehistoric Habitation and Probable Burial Site in Crane County, Texas

The Crane Dune site (41CR61) was identified by AmaTerra archaeologists during a survey on behalf of the Texas Department of Transportation (TxDOT) prior to the widening of Highway 385 in Crane County, Texas. The site consists of at least two components (Late Prehistoric and Late Archaic) centered on stabilized sand dunes. The cultural occupations span a 40–50 cm thick dark anthrosol layer consisting of charcoal-stained sandy sediments, suggesting intensive occupation. Excavations focused primarily on exposing and recording features, which consisted primarily of rock-lined ovens in shallow basins, as well as deeper cooking pits without rocks. Another pit feature was determined likely to be a human burial, based on the presence of a human molar and a carved bone pendant observed in the fill sediment. Artifacts from the site include dart and arrow points, occasional ground stone and ceramic sherds, chert and quartzite debitage, at least two obsidian flakes, faunal material ranging from rodents to bison, and a possible turquoise pendant recovered near the burial feature. The Crane Dune site continues to provide a wealth of archaeological data in an under-studied region of Texas. Excavations are currently ongoing, and this paper will present the preliminary results of the project.

Lassen, Robert [37] see Ramos Berrios, Alanis

Latorre, Claudio [171] see McRostie, Virginia

Latorre, Claudio [74] see Ugalde, Paula

Lattanzi, Gregory (New Jersey State Museum)

[114]

Discussant

Lattanzi, Gregory (New Jersey State Museum)

[172]

The Good, the Bad, and the Not So Great: Archaeological Curation at the New Jersey State Museum

Unlike most state museums, the New Jersey State Museum operates directly under the Department of State, and this has its advantages and disadvantages. On the one hand, we enjoy interacting with the public through programming, exhibitions, research, presentations and publications. Then on the other hand, budget cuts, reduced staff, and leadership changes potentially every four years, puts tremendous strains on the professional staff. As Curator and State Archaeologist my position is mandated to care for New Jersey's cultural resources, direct the NAGPRA compliance, and the site registration program among other duties. It is hard to keep up with the amount of material generated by cultural resource management, as well as having to put up exhibitions and maintain the site registration program. This presentation lays out many of these and other issues faced by the Bureau of Archaeology at the New Jersey State Museum.

Latychev, Konstantin [252] see Powell, Evelyn

Lau, George (Sainsbury Research Unit, University of East Anglia)

[106]

Discussant

Lau, George [174] see Chicoine, David

Lau, Jason [64] see Hodgetts, Lisa

Laughlin, Tyler (Texas A&M University), Joshua Keene (Baylor University) and Michael Waters (Texas A&M University)

[19]

Archaeological Investigations of the Late Quaternary from Hall's Cave

Recent investigations of Hall's Cave between 2017–2018 have revealed human use and periodic occupation since 10,500 cal yr B. P. The fantastic preservation of the cave stratigraphy has kept multiple hearth features and burned lenses intact. Radiocarbon dates from these features have demonstrated a comprehensive chronological record from the end of the Pleistocene through the Holocene. A preliminary lithic analysis corroborates these dates with point typologies found in or near features. Features and lithics are also clustered into groups at different intervals throughout the Archaic Period, indicating periods of increased use of Hall's Cave. The features, dates, point typologies, and density of occupation highlight key factors in understanding and developing the narrative of central Texas during the Late Quaternary.

Laugier, Elise Jakoby (Dartmouth College) and Jesse Casana (Dartmouth College)

[124]

Agricultural Landscapes of the Mesopotamian-Zagros Borderlands

The Upper Diyala River Region in Northern Iraq has long served as a strategic political, economic, and cultural borderland between the Mesopotamian alluvium and the Zagros Mountains. The region is also environmentally complex encompassing a steep gradient of agro-ecological zones ranging from irrigated alluvial lowland plains, to upland dry farming valleys, and mountainous highlands. Thus, from the Neolithic onward, the Upper Diyala has presumably hosted a variety of agropastoral traditions. Yet only the most recent land use features, such as canals, field boundaries, and trackways, are easily resolvable in available satellite imagery. Coupled with regionally poor preservation conditions for macrobotanical remains, we are challenged by limited empirical data for understanding earlier periods of agricultural land use. As part of the Sirwan (Upper Diyala) Regional Project (SRP), this paper draws on a variety of complementary datasets at multiple scales—from historic aerial imagery to phytolith analysis—to systematically investigate this diverse and challenging agricultural landscape. Results demonstrate the necessity of integrated, multi-scale approaches for addressing these preservation problems. Additionally, the paper discusses the critical importance of also understanding modern land use and the ongoing challenges of reconstructing ancient agricultural landscapes in rapidly developing, active agricultural zones.

Laugier, Elise Jakoby [147] see Hill, Austin

Laumbach, Karl (Human Systems Research Inc.)

[156]

Ritual Architecture and Landscapes at Cañada Alamosa, New Mexico

The Cañada Alamosa Project, located in southern Socorro County, New Mexico, tested four sites that yielded an array of ceramic types that span 800 years and are associated with both Ancestral Pueblo and Mogollon ceramic traditions. The four sites are located in a deep canyon that opens up to provide arable land. The high terraces and cliffs are in the shadow of Montoya Butte, a defensive site for an early pithouse population. The butte is topped by a shrine that almost certainly spanned the centuries of occupation in the canyon. Investigations in the canyon proper included the definition of ritual architecture, ancient trails, rock art and abandonment rituals that represent several distinct periods of the pithouse to pueblo sequence. Rock art, both petroglyphs and pictographs, are limited in number but are focused on grottos, caves and high cliffs. Most trails on the valley bottom have been eradicated by flooding but trails on the slopes and terraces lead to the shrine and to the waters of the Ojo Caliente, three miles distant.

Laurent, Antoine [107] see Ard, Vincent

Lauricella, Anthony**[261]***The Qusur Landscape after the Umayyads*

The art historical character of many excavations at important Islamic sites has had a significant impact on the development of Islamic archaeology as a discipline. Islamic period sites are often viewed through a narrow lens shaped by an overreliance on frameworks derived from historical texts, poetry, and dynastic periodization. This way of viewing the Islamic past in thin temporal slices also has spatial ramifications, which obscure the connections between sites and their place in wider landscapes and processes. This paper discusses the Umayyad qusur, a group of typologically similar structures spread across Bilad al-Sham, as a purpose-built landscape system. I test the various hypotheses about Umayyad occupation at the qusur by analyzing this landscape in later periods. Analysis at these spatial and chronological scales opens new questions about the trajectory of settlement and central control of Bilad al-Sham after the eclipse of the Umayyads.

Law Pezzarossi, Heather (Syracuse University)**[112]***Reconsidering Residence: Deprivileging Settler Landscapes in the Study of Eighteenth- and Nineteenth-Century Nipmuc Dwellings*

This paper considers the diverse practices of "residence" (see Silliman 2005) that emerged within the Nipmuc community as a response to colonial practices of displacement, dispossession, and confinement in eighteenth- and nineteenth-century Massachusetts. Rather than proposing a typology of Indigenous dwelling, I illustrate how Nipmuc people devised diverse strategies of continuing to occupy their ancestral landscapes despite settler colonial imperatives of ownership and private property. I discuss ways of residing that don't involve land ownership in severalty at a time when Nipmuc landholdings were severely threatened. I use local historical resources to plot the locations of Native dwellings that would not be accessible in the colonial archive due to their temporary forms and unsanctioned locations. In so doing, this study will reveal many potential, previously unidentified, eighteenth- and nineteenth-century Native dwelling sites that were built into hillsides, tucked into wetlands, hidden on Euro-American farmland, and woven into urban environs that are difficult to find in official deeds and other accounts of privately held property. This work will help to illustrate the continued residence of Nipmuc people on the New England landscape regardless of ownership, and facilitate the study of long term Nipmuc survivance.

Lawrence, John (Cardno) and Scott Fitzpatrick (University of Oregon)**[123]***A Synthesis of Carriacou's Networks through The Objectives of Ceramic Petrography*

Ceramic petrography conducted in the southern Lesser Antilles has largely centered on the island of Carriacou. Pottery here exhibits a wide variety of textures and compositions, but with no known native raw material sources. Along with the presence of a high number of translocated animals, the island is thought to be a nexus point for interaction spheres in the region. Here we synthesize current and past petrographic research in the Antilles pottery provenance and use of various raw materials. Previous investigations have used and adapted the Dickinson method from Oceania to characterize and source raw materials seen in Carriacou's temper groups within the larger Caribbean region. These include Potassic, Igneous, Quartzose, Placer, and Mixed. Of these five temper groups, only the Placer temper is thought to be native and probably derives from the Greater Antilles. The exact source of the Igneous temper is still unknown but is speculated to be from somewhere in the Lesser Antilles. The Quartzose temper source is likely from Barbados to the East. The Mixed temper group is believed to be sourced on nearby Union Island. These studies demonstrate the connective nature of prehistoric Amerindian groups in the Caribbean but require further research to satisfactorily explain.

[123]*Chair***Lawrence, Ken (SWCA-Texas State University), Charles Frederick (Consulting Geoarchaeologist-Geologist), Steve Carpenter (SWCA), Mark Bateman (University of Sheffield, United Kingdom) and Ken Lawrence****[194]***Geoarchaeological Investigations at 41MS78, a Stratified Archaic Site on the Llano River in North Central Texas*

On behalf of the Texas Department of Transportation Austin District, SWCA Environmental Consultants conducted data recovery investigations of a stratified prehistoric site (41MS78) along the Llano River in Mason County, Texas. The site is composed of stratified cultural components in deep alluvial sediments exposed in roadcuts along both sides of an existing roadway. Cultural materials, mainly chipped stone tools and earth ovens composed of fire-cracked local limestone, span the Archaic (8800–2000 BP). A major focus of these investigations was geoarchaeological investigations that examined numerous stratigraphic columns to assist in interpreting cultural analytical units, determining site integrity, and identifying chronostratigraphy of the site deposits. This presentation discusses the results of the site investigations, focusing on the depositional context of multiple, stratified occupational zones correlated with extensive radiocarbon and optically stimulated luminescence (OSL) data.

Lawrence, Ken [194] see Lawrence, Ken

LaZar, Miranda (University of Arizona) and Jonathan Dombrosky (University of New Mexico)**[129]***Tracking Individual Raptors in the Archaeological Record Using Stable Isotopes: Limitations, Possibilities, and Causes of Intraskelatal δ -Value Variation*

The ability to track trade of socially valued goods made from raptor bones can give archaeologists a deeper understanding of both human-raptor interactions and networks of exchange. Reconstructing distribution of such goods from production centers, however, requires the ability to identify bones from an individual bird. We explore a method to track the trade of raptor remains by examining

intraskelatal variation and interindividual separation of $\delta^{13}\text{C}$, $\delta^{15}\text{N}$, and $\delta^2\text{H}$ from 20 modern Cooper's Hawks (*Accipiter cooperii*). Our study is supplemented by analysis of the stable isotope signature of soft tissues from these hawks. Soft tissues have different turnover rates, which allows us to assess the linkage between individual hawk feeding ecology and interindividual separation. Archaeologists may be able to reconstruct networks of exchange in the archaeological record with stable isotope analysis.

Lazik, Lauren, Robert Hard, Steven Shackley, John Roney and Paige Hayhurst

[5]

An Obsidian X-ray Fluorescence Analysis of Early Agricultural and Medio Period Artifacts from Northwest Chihuahua, Mexico

This x-ray fluorescence analysis of 235 obsidian artifacts from northwest Chihuahua combines the original analysis of 89 items with a recent analysis of the remaining 146 obsidian pieces recovered during fieldwork. The sample is dominated by artifacts from the Early Agricultural period site of Cerro Juanaqueña ($n = 198$) but includes a sample from the Medio period ($n = 30$). The results identify six sources, including the Selene source in the highlands of northeast Sonora, three sources from the Chihuahua basin and range country (Ojo de Federico, Sierra Fresnal, and Los Jagüeyes), and two sources from the New Mexico Bootheel region (Antelope Wells and Animas Mountains). The primary source locations for Selene, Sierra Fresnal, and Antelope Wells are known while the Ojo de Federico, Los Jagüeyes, and Animas Mountains types are only known from secondary sources. The results indicate obsidian was being procured widely during the Early Agricultural period with an apparent substantial shift by the Medio period.

Le Bourdonnec, François-Xavier [30] see Sánchez de la Torre, Marta

Le Moine, Jean-Baptiste (Université de Montréal) and Christina Halperin (Université de Montréal)

[168]

Shifting Terminal Classic Maya Political-Economies from the Perspective of Ucanal, Petén, Guatemala

This paper, in honor of Ronald Bishop's contributions to chemical composition analysis, examines changes in trade, political alliances, and interaction spheres in the Southern Maya Lowlands during the transition between the Late Classic and Terminal Classic periods. Incorporating both Instrumental Neutron Activation Analysis and portable X-Ray Fluorescence analyses to identify the chemical composition of ceramic pastes, our investigations provide evidence for a political resurgence during the Terminal Classic period of what were formerly secondary or more subordinate political centers. Our study focuses, in particular, on the archaeological site of Ucanal and underscores both its long-standing and new interactions with sites in Belize, the Petexbatun region, and Yucatán.

Le Roux, Petrus [61] see Santana Sagredo, Francisca

Lebehn, Jason [100] see Ono, Rintaro

LeBlanc, Megan

[8]

Quebrada Debris Flows and Their Relationship to Agriculture at Tacahuay Tambo

This poster presents a survey of the debris flow deposits and agricultural units at Tacahuay Tambo, a Late Intermediate (1000–1476 AD) site located on south coast of Peru. Quebrada Tacahuay in combination with the Tambo, has 12,000 years of cultural history. Therefore, there are numerous flood deposits that add to the complexity of the stratigraphy. Debris flows are especially impactful in this area when paired with tectonic events that loosen up existing rocky material. The Miraflores Event (~14 century AD), was one of these major disasters that impacted cultural activity in this region. These deposits can be found in the Tacahuay quebrada. Using GPR techniques, sediment samples scanned with a handheld XRF, and geologic analysis, I studied differences in soil composition and texture to identify continuity between debris flow units. In addition, a survey using drone footage was used to locate agricultural terracing around to show the potential impact of flood events on the people who inhabited this area. This initial survey provides the geologic context for future excavations at Tacahuay. Through a combination of remote sensing and sediment analysis tools, it is possible to study the relationship between the complex stratigraphy found at this site.

Lebrun, Brice [36] see Holliday, Trenton

Lecher, Alanna [228] see Watson, April

LeCount, Lisa (University of Alabama)

[128]

The End of Chicanel: Ceramic Diversification, Categorical Identities, and Regional Networks

The onset of Maya kingship and the nature of regional networks will be described using Chicanel pottery and the language of network analysis. The Chicanel Ceramic Sphere is noted for its enormous geographic range and its highly consistent styles. As such, Chicanel pottery is the materialization of the "strength of weak [social] ties" (Granovetter 1973) maintained through exchange relations and information flow from 300 BC until AD 400. However, around 100 BC Chicanel pottery began to diversify and new subcomplexes occurred during the Terminal Preclassic to Early Classic periods. These subcomplexes are subsumed under the

highly debated term "Protoclassic," which describes two different (probably chronologically staggered) sets of decorated pottery styles thought to be restricted to ritual contexts and certain geographical areas. I suggest Protoclassic styles signal a shared categorical identity associated with early kingship (variously manifested in the form of corporate leaders or nascent ajawob) and the ceremonialism that underpinned it. Households also bought into this emergent ceremonialism through the use of Protoclassic pottery, albeit in limited quantities. Concomitantly, regional networks narrowed, evidenced by the development of locally distinct "domestic" assemblages. These ideas will be evaluated by comparing pottery assemblages from Actuncan, Belize with other sites in the Lowlands.

LeCount, Lisa [54] see Blitz, John

Ledbetter, Jerald [232] see Jones, KC

Ledesma Bouchan, Patricia (Templo Mayor Museum)

[109]

Getting the Archaeological Context Back: Some Principles of the Museology in Templo Mayor, Mexico

Under strict terms, every object presented in a Museum has lost its context, except maybe for the historical houses that keep the objects in their original places and the spatial relationship between them. Even a museum such as Templo Mayor, does not present most of the objects in their original place nor maintains the relationship between them. The Templo Mayor Museum is an iconic place for the modern Mexican archaeology. With its exemplary trajectory, under the leadership of Eduardo Matos Moctezuma, the Museum has its origin in the very need to preserve and maintain together the awesome richness and variety of the materials recovered by the archaeological project that started in 1978. Recently, the Templo Mayor Museum has been developing specific works to reproduce the original context on some of its temporary exhibits, also we are introducing more information and giving our visitors tools to understand and discover the humans behind the objects. All these efforts come together under specific values in coherence with the mission of the Instituto Nacional de Antropología e Historia (INAH), to pursue the preservation of the archaeological objects, the contexts and their inherent values, in order to get closer to the understanding of cultural diversity.

Ledin, Lauren (University of Chicago) and Hongbin Yue (Institute of Archaeology, Chinese Academy of Social Sciences)

[205]

New Perspectives on Age in Early China: A Bioarchaeological Life Course Approach to the Late Shang Capital of Yinxi (ca. 1200–1050 BCE)

Mortuary theory of early China commonly describes differences among graves and grave goods as indicative of differences in individuals' wealth and lineage affiliation. While early Chinese graves are well-explored from the perspective of archaeology, history, and art history, the skeletal remains found within them only became an important subject of study relatively recently in the history of research at many early Chinese sites, such as the UNESCO World Heritage Site of Yinxi in Anyang, China (ca. 1200–1050 BCE). Even with this new body of evidence, its benefit to researchers, including bioarchaeologists eager to implement aDNA and stable isotope analyses, is limited by a mortuary theory that never sought to include skeletal data in the first place. In this paper, I discuss bioarchaeological research on the skeletal remains of approximately 150 individuals excavated from a single lineage neighborhood at Yinxi, ranging from rarely studied infant remains to elderly adults. In analyzing the resulting age estimates through the lens of life course theory, I consider how a systematic understanding of age can either bolster or improve the extant mortuary theory for early China, and address ongoing questions related to kinship, personhood, and ancestor veneration.

[205]

Chair

Lee, Hyunsoo (University of Oregon)

[199]

Early-Mid Holocene Subsistence through Archaeobotany: Case Studies in Korea and NE China including Gosanri, Gungokri, and Houtaomuga

This study focuses on tracing subsistence trajectories amid Early-Mid Holocene environmental change through archaeobotanical evidence. Archaeobotanical remains from coastal, island, and lacustrine sites across Korean Peninsula and northeastern China are analyzed. Starch, phytolith, charred plant remains, and other archaeological data are used to produce more comprehensive understanding of subsistence trajectories. One of the main questions in this research is how occupants in certain landscape have interacted with surrounding resources. Early Holocene societies in Korea and NE China have been often defined as a hunter-gatherer economy with no existence of plant managements, due to lack of accumulated archaeobotanical evidence. The main objective of this research is to test usefulness of archaeobotanical analysis in prehistoric Korea and NE China studies. Concepts such as niche construction, low-level food production, and hunter-farmer are applied to interpret the botanical findings linked with other archaeological evidences. Case study sites include Gosanri in Jeju Island, Gungokri in Mokpo, Korea, and Houtaomuga in Jilin, China. This study aims to contribute for mapping diverse economic niche constructions, human-environmental dynamics, and sociocultural transitions amid environmental changes of the Early-Middle Holocene worldwide.

Lee, Lori (Flagler College)

[3]

Bottles and Beads: Glass Objects at Fort Mose

Classification systems that focus on primary function can obscure the cultural significance of objects for the people who used them. Glass bottles store liquids and glass beads are used for adornment. Yet these same objects sometimes had unique cultural meanings for African Americans and African Americans who used them. In large assemblages bottles often get analytically

separated from beads because of primary function. In a small assemblage, we have the opportunity to explore relationships among objects made of the same material with different primary functions. This paper examines attributes of glass objects recovered at Fort Mose in St. Augustine, Florida and their contexts to consider cultural insights beyond practical function.

[3]

Chair

Lee, Lori [3] see Slatowski, Jenna

LeFebvre, Michelle (Florida Museum of Natural History), Jessica Oswald (Florida Museum of Natural History), Julie Allen (University of Nevada, Reno), David Steadman (Florida Museum of Natural History) and Robert Guralnick (Florida Museum of Natural History)

[27]

Transdisciplinary Questions and Interdisciplinary Approaches to Caribbean Historical Ecology: The Anthropogenic History of Endemic Hutias (Capromyinae)

Cultural heritage and biodiversity are inextricably linked through a long history of human-environment interactions. The human colonization of the Caribbean Archipelago ca. 7,000 years ago marked the beginning of significant and lasting anthropogenic impacts across this island landscape, including the extirpation and extinction of native and endemic animals. In this presentation, we discuss the historical ecology of hutias, a group of rodents endemic to the Greater Antilles and The Bahamas. Hutias are significant for their breadth of species and morphological diversification, and an over 50% extinction rate during the Holocene. This rate of extinction is readily attributable to a long and variable history of human activities. With a focus on Bahamian hutias (*Geocapromys ingrahami*) specifically, we present a suite of interdisciplinary data from our ongoing research focused on their historical ecology prior to and after human colonization of the Bahama archipelago (The Bahamas and the Turks & Caicos Islands) ca. AD 700/800. Drawing on zooarchaeological and paleontological hutia distribution records, morphometric specimen comparisons, isotopic signatures, and ancient DNA, our data indicate previously unrecognized indigenous human influence over Bahamian hutia distribution, diet, and genetic diversity. This study exemplifies the need for and critical role of interdisciplinary collaborations in Caribbean historical ecology.

LeFebvre, Michelle [271] see Ardren, Traci

LeFebvre, Michelle [212] see Harvey, Virginia

LeFebvre, Michelle [59] see Jorissen, Philippa

LeFebvre, Michelle [146] see Miller, Sarah

Legrand, Victor [107] see Lueth, Friedrich

Lehner, Joseph [175] see Martin, Samuel

Leight, Megan (CUNY Graduate Center) and Brent Woodfill (Winthrop University)

[168]

Honoring the Legacy of Ron Bishop at Salinas de los Nueve Cerros

The study of ancient Mesoamerican economic exchange systems is intricately connected to the work and legacy of Ron Bishop, who pioneered the use of INAA in archaeology for ceramic analysis, moving it far beyond visual identification to compositional analysis. For the archaeological project of Salinas de los Nueve Cerros located in the Transversal region of Guatemala at the intersection of the Maya Highlands and Lowlands, Bishop's work has helped illuminate cultural interaction and exchange at this economic hub. This presentation will focus on discussing trade at the riverine port recently excavated at the site, which boasted a vibrant trading economy with an exceptionally long occupation history from the Middle Preclassic through the Late Classic periods. While ports have been exceptionally hard to characterize and identify in the Maya world, a decade of work on the site's ceramic typology through INAA data testing has helped define the local ceramic sequence, highlight the non-local trading spheres, and solidify the site's connections with the greater Maya world.

Leja, Daniel [149] see Schleher, Kari

Lekson, Stephen (University of Colorado Museum of Natural History)

[156]

Discussant

Lemke, Ashley (University of Texas, Arlington)

[37]

Chair

Lemke, Ashley (University of Texas, Arlington)

[238]

Submerged Prehistoric Archaeology on the Atlantic Continental Shelf

Given the last two million years of global fluctuations in climate and ocean levels, submerged landscapes are arguably the most

important zone for addressing questions concerning human evolution and migration and are unique for their potential to preserve extraordinary evidence of prehistoric peoples. A discovery off the coast of North Carolina on the Atlantic continental shelf offers an exceptional new research locality, with a rock outcrop, mammoth bones, and a likely paleo-river channel preserved in 80 feet of water, 25 miles offshore. This raw material source may provide connections to Paleoindian sites on the mainland; and a locus of raw material, big game, and fresh water provides an ideal setting for prehistoric archaeological sites. Results from preliminary field work are presented from the area around this discovery which offers an ideal laboratory for linking submerged landscapes to terrestrial ones and for methods development for prehistoric underwater archaeological research.

Lemke, Ashley [170] see Wernecke, D. Clark

Lemly, Marina (University of New Mexico), Amy Thompson (University of New Mexico) and Keith Prufer (University of New Mexico)

[7]

Modeling Ancient Maya Transportation and Trade Routes in Southern Belize with a Least Cost Path Analysis

Little is known of the trade routes and paths that the Maya used traveling from city to city. We model potential past transportation and trade routes and how people moved across the landscape using a Least Cost Path Analysis (LCP). Our study focuses on the transportation routes and interactions among Classic Period (AD 250–800) Maya centers in southern Belize. Using the slope of the terrain, we created LCPs in ArcMap to show the potential paths between 18 ancient Maya cities. The LCP results indicate possible corridors that form where several LCPs intersect and link up, suggesting that certain paths were likely more frequently used by travelers throughout the region. Some sites are situated on the corridors of several LCPs, suggesting that the location of these sites was advantageous for trade and interactions. Furthermore, the intersections among the LCPs are ideal locations for sites, where travelers would have stopped to rest during their journey. This study using geospatial analyses to model how past people traveled across the landscape and may reveal the locations of additional minor centers.

Lemming, Jennifer (University of Wyoming)

[75]

Agate Basin Stratified Paleoindian Site: Faunal Analysis from Area 1

Agate Basin is a significant stratified Paleoindian site with multiple kill/processing localities and campsites. The Area 1 bone bed was excavated in 1942, 1961 and 1975 by the Smithsonian Institute and the University of Wyoming. Bone was not collected during the earlier excavations and an insignificant assemblage was encountered in 1975. However, bone was collected in 2004 and 2008 when the back dirt from previous work was excavated. The results of 2004 zooarchaeological analysis were inconclusive with regards to Paleoindian behavior due to small sample and attritional bias. The bones from the 2008 analyzed here increase the sample size and provide a more precise composition of the faunal assemblage. Previous studies of Area 2 of the Agate Basin site suggest that Area 1 was the primary kill area for the Agate Basin components of Area 2. Comparisons between the Area 1 bonebed and the Area 2 bonebed and other bonebeds could support this hypothesis or provide evidence supporting different interpretation.

Lemonnier, Eva [102] see Arnaud, M. Charlotte

Lent, Kyle [18] see Delgado, James

Lentz, David (University of Cincinnati), Brian Lane (University of Oregon) and Kenneth Tankersley (University of Cincinnati)

[258]

Plant Fibers and Associated Bioactive Compounds Used to Protect Hopewell Copper Artifacts

Two Hopewell copper artifacts, a breastplate and a celt, were recovered from the Twin Mound site (33Ha29) in southwestern Ohio. An AMS radiocarbon age of 2030±40 BP was obtained on collagen extracted from an *Ursus americanus* canine located adjacent to the artifacts. An environmental scanning electron microscope (ESEM) was used to determine the species of plant fibers used to manufacture the textile covering the artifacts. The fabric employed to wrap the breastplate was manufactured from *Asclepias incarnata* (milkweed) fiber and the fabric covering the celt was manufactured from *Eryngium yuccifolium* (rattlesnake master) fiber. The textiles were preserved by a combination of copper carbonate hydroxide ($\text{Cu}_2(\text{CO}_3)(\text{OH})_2$) and copper carbonate ($\text{Cu}_3(\text{CO}_3)_2(\text{OH})_2$), which resulted from the chemical weathering of native copper. Alternatively, it seems likely that the textiles used to wrap the artifacts were applied by the end user to protect the objects. This paper will explore the numerous bioactive compounds produced by each of these plant species to evaluate their potential use as preservative agents.

Lentz, David [206] see Quiroz, Carlos

Leppard, Thomas (Florida State University) and Sarah Murray (University of Toronto)

[210]

Coercion, Violence, and Inequality in Archaeological Perspective

A central contradiction that has emerged in social science scholarship concerns how wealth inequalities are built and maintained. Historians, including Charles Tilly and Ian Morris, have argued that coercive violence (or its threat) is central to how groups and institutions construct unequal social and economic systems. This interpretation is now challenged by the work of Thomas Piketty and colleagues, who have shown that in capitalist systems conditions of exaggerated inequality usually result from gradual, generally peaceful processes of resource accumulation due to changes in the relative valuations accruing to labor and capital over

time. Conversely, large-scale social violence appears to erode and undermine wealth inequalities, an analysis supported by the diachronic perspective offered by Walter Scheidel. In this paper, we introduce this and other problematics surrounding the study of violence and inequality in the archaeological record. We discuss how the archaeological evidence from prehistoric societies might add to our understanding of the variety of peaceful and violent dynamics that lead to inequality in human societies and emphasize the value of bringing a comparative approach to the study of coercion as a prominent force in shaping, causing, and maintaining archaeologically apparent disparities in well-being and access to resources.

[210]

Chair

Leque, Kirstyn [213] see Clark, Jessica

Lerner, Shereen (Mesa College)

[254]

Connecting the Past to the Present: The Social Relevance of Archaeology

How can we help students better understand how the past connects to the present? Our efforts in the classroom provide students with an opportunity to learn about the common threads connecting ancient civilizations. The elements that we share with students provide us with a story of humanity and its successes and failures. We focus our pedagogical strategy on a thematic approach, connecting regions to themes such as trade, the significance of water, urbanization, political power, climate change, food, overpopulation, and more. This integrated approach, using active learning techniques, helps students to understand the importance and value of our past and its connection to our present. In the process, students gain a greater understanding of a world heritage that is tied to issues they are confronting today.

Lerner, Shereen [98] see Green, Margerie

LeRoy, Sarah [186] see van Leeuwen, Willem

Leroy, Stéphanie [28] see Hendrickson, Mitch

Lesage, Louis [12] see Birch, Jennifer

Leslie, David (Archaeological and Historical Services Inc.) and Sarah Sportman (Archaeological and Historical Services Inc.)

[13]

Preliminary Results from Site 4-10B (Brian D. Jones Site): Paleoindian Occupation of the Farmington River Valley, Avon, Connecticut

In the winter of 2019, AHS, Inc., under contract to the Connecticut Department of Transportation, conducted Data Recovery excavations at Site 4–10B along the Farmington River in Avon, Connecticut. Excavations revealed at least three stratified occupation levels at the site; two are unquestionably Paleoindian and one a possible Early Archaic occupation. We recovered a rich dataset of lithic and botanical artifacts, as well as 29 cultural features, which may be indicative of living areas. To date, 4–10B is the oldest occupied site in Connecticut and the only site with stratified Paleoindian deposits in New England. Lithic raw materials include local (chalcidony and siltstone) and exotic (Normanskill chert, New Hampshire rhyolite, and Hardyston jasper) sources. Analyses are ongoing, but suggest highly specialized activity areas within the site in each occupational level, including the production of fluted points and animal and plant processing using the typical Paleoindian tool kit (*pièces esquillées*, endscrapers, sidescrapers, bifaces, utilized flakes, and gravers) and non-typical tools (grinding stones). In this paper we present preliminary results of the Data Recovery and discuss the vital role Dr. Brian Jones played in the discovery of Site 4–10B and his support of the excavations as Connecticut's State Archaeologist.

Leventhal, Alan [233] see Fournier, Nichole

Levi, Laura (University of Texas, San Antonio)

[53]

From Temple to Polity: Wari Camp's Classic Period Political Landscape

In the Maya lowlands, temples are one of the most visible clues to ritual activity available to archaeologists. They also are understood to have been closely associated with the exercise of political authority—that is, unless they are found outside precincts of monumental architecture in so-called “shrine groups.” In the latter instance, residential temples have been interpreted as indicators of ancestor veneration or of ritual specialists. However, there is reason to question whether ritual practice ever proceeds in the absence of an authorizing hand. This issue will be explored using data from the ancient Maya community of Wari Camp in northwestern Belize. Here, a set of residential temples suggests a new way forward in the study of lowland Maya power politics.

Levi, Laura [230] see Sheumaker, Christian

Levi, Sara (Hunter College, CUNY), Valentina Cannavò (Univ. Modena e Reggio Emilia, IT), Peter Day (Univ. Sheffield, UK), Domenica Gulli (Soprintendenza Agrigento, IT) and Alessandro Vanzetti (Univ. Roma 1 Sapienza, IT)
[196]

Sardinia Comes to Sicily? Nuragic Pottery at Cannatello

Cannatello lies in a key position for trade, on the southern coast of Sicily, only 1.5 km inland in a walled settlement. The site is exceptional, hosting an assemblage whose ceramic and other material parallels lie with the major harbors of the Mediterranean Late Bronze Age, participating in very early, long-distance maritime trade. These include transport jars familiar from the Levantine coast, southern Cyprus, Kommos in Crete, Malta and the Bay of Cagliari in Sardinia. The site dates to Middle BA3–Final BA in Italian terms, corresponding to the Aegean phases LH IIIA–LH IIIC, a crucial time which encompasses the Mycenaean palaces and their collapse. Of special interest is the recent identification of a range of pottery of Sardinian Nuragic style, which has been subject to ceramic compositional analysis (46 samples). These include imported large storage jars, but a range of Sardinian-style small bowls (conca) have both imported examples and those that are clearly manufactured locally, using a grog-tempering tradition more characteristic of Bronze Age Sicily. We consider the implications of this for understanding the movement of potters and the interaction of pottery traditions in this, the first example of Nuragic pottery made outside of the island of Sardinia.

Levin, Maureece (Stanford University), Aimee Miles (Uppsala University) and Katherine Seikel (Australian National University)
[100]

Eating Pingelap: Archaeobotanical and Zooarchaeological Perspectives from a Micronesian Atoll

Pingelap Atoll, located in central-eastern Micronesia, was colonized by 1550–1700 cal BP. Although these settlement dates are only a few hundred years later than those of nearby high islands such as Pohnpei and Kosrae, the environment presents notably different challenges and opportunities for subsistence. In this paper, we engage with archaeobotanical and zooarchaeological data to examine human-mediated landscapes and seascapes of the Pingelapese past, and the culinary patterns that developed in the local human community. Ethnoarchaeological interviews and observation focusing on both farming and fishing inform the interpretation of this research, as horticulture and fishing continue to be an important part of subsistence for the modern Pingelapese population. Subsistence datasets show evidence for usage of a variety of local fish and shellfish over a long period of time, as well as sea birds, turtles, and introduced chickens. Coconut, pandanus, and several introduced plant taxa constitute important crops, and phytolith data demonstrate, long-term anthropogenic fertilization of soils.

Levin, Samuel (Wyoming State Historic Preservation Office) and Shane McCreary (Wyoming State Historic Preservation Office)
[190]

Advances in Wyoming Cultural Resource Data Access

In May 2019, the Wyoming State Historic Preservation Office migrated to a fully digital submission process using a web-application called WyoTrack. WyoTrack couples modern database technology with integrated GIS resources to streamline the Section 106 consultation process. In doing so, cultural resource data are managed more effectively and with enhanced data quality. Cultural Resource Management data are frequently viewed as an underutilized source for academic research. This underutilization is due to a variety of factors including inaccessibility and poor data resolution. WyoTrack provides an online platform for researchers to access and explore these data. Moreover, these data are encoded using a standard that vastly expands academic research potential, far exceeding the minimum standards necessary for Section 106 compliance. With the heightened accessibility and data quality offered by WyoTrack, the Wyoming SHPO anticipates that this system will become a foundation for future archaeological research, fulfilling both academic and CRM purposes.

Levine, Marc (University of Oklahoma), Alex Badillo (Indiana State University), Amanda Regnier (University of Oklahoma) and Scott Hammerstedt (University of Oklahoma)
[189]

Quantifying Monte Albán's Main Plaza: Digital Mapping, Spatial Analysis, and Social Relations

In this paper, we take a quantitative approach to examine the history of Monte Alban's Main Plaza and how physical changes in this space may reflect changes in sociopolitical relations through time. This study draws on a recent digital mapping project of the Main Plaza that utilized a robotic total station in conjunction with UAV(drone) technology. We present the results of a microtopographical analysis of the Main Plaza surface that highlights previously underappreciated features, including two large enclosures that subdivide much of the plaza's west side. We also present new estimates for the total area of the Main Plaza, as well as its smaller open spaces, and compare these to analogous spaces from other sites in Mesoamerica. Additionally, we present the results of a viewshed analysis to investigate the degree to which activities carried out in distinct areas of the plaza were visually accessible to others in attendance. Finally, we carry out estimates of volume for all structures on the Main Plaza based on 3D renderings of the architecture. This facilitates a study of labor investment for the Main Plaza, including attempts to track the pace of these efforts over several centuries.

Levinson, Judith [258] see DeLeonardis, Lisa

Levy, Janet (UNC Charlotte)
[114]

Discussant

Levy, Thomas [147] see Liss, Brady

Lévy Contreras, Jessica

[268]

Excavating the Field and Museums: Recovering Data on Textiles from Corral Redondo

Textiles recovered in Corral Redondo, located in the confluence of the Ocoña and San Juan de Chorunga Valleys in the Arequipa region of southern Peru, were analyzed and preliminary conserved under the Corral Redondo Archaeological Project in 2019. Although archaeological contexts and material have suffered advanced deterioration due to the extreme looting of the site, textiles and artifacts assemblages, including basketry, lithic, shell and featherworks, still provide important data to complement research done by Heidi King in 2013 and 2016. Comparing contextual and technical relationships between excavated textiles and other objects ascribed to the site on display at the Museo IE Miguel Grau "Luis Guillermo Lumbreras" (Iquipi) and the Museo Municipal Histórico "Guillermo Zagarra Meneses" (Arequipa), this paper presents new perspectives on production practices, mortuary patterns, and worldview on textiles from the Ocoña Valley between the end of the Middle Horizon and the beginning of the Late Horizon periods.

Lewandowski, David (Logan Simpson)

[122]

Persistent Places, Settlement Patterns, and Shifting Relations in the Mogollon Highlands: A Case Study along Eagle Creek, Eastern Arizona

This poster examines settlement patterns and the concept of persistent places and its implications regarding population circulation, community, and identity during the Pithouse and Pueblo period occupations (AD 700–1450) within the Eagle Creek area of the Apache-Sitgreaves National Forests (ASNF) in eastern Arizona. Eagle Creek is a perennial stream which flows south from the Mogollon Rim to the Gila River along the border of the ASNF and San Carlos Apache Reservation, immediately east of the Point of Pines cultural region. A recently completed 5,627-acre survey within the study area identified new sites and information pertinent to addressing site occupation spans and external interaction. This study examines site occupation spans and site function to reconstruct persistence, the reuse of sites, population movements, and changes in community location and structure in the Eagle Creek area over time. Changes in the presence and proportions of non-local decorated ceramics are used to discuss the changing external relationships during the Pithouse and Pueblo periods, particularly as it relates to the Mimbres and southern Cibola cultural areas. Such changes may tell us about shifting identity formation within the area over time, with implications for the adjacent Point of Pines area and greater Mogollon Highlands region.

Lewis, James [234] see Frieman, Catherine

Lewis, Lauren and Lisbeth Louderback

[177]

Using Starch Grains to Study a Shift in Food Processing Technology in Cowboy Cave, UT

Shifts in the food processing technology of North America's arid southwest have been used to hypothesize about the origin of dietary shifts in the past. The oldest coiled basket in the Americas, dated by Geib and Jolie to 7950 ± 50 RCYBP, was determined not to have been used for food processing. This discovery has raised questions about the source of this technological innovation. It is possible that if not motivated by a shift in food processing procedures, this change is a result of cultural diffusion. In an attempt to better understand the transition from the simpler twined method of weaving to more complex coiled basketry, this project examines starch grains extracted from ground stones and coiled parching or grinding baskets spanning from the 7519 ± 42 BP to the Terminal Archaic. With the identification of similarities and differences in types of starch found on different tools, we are finding indications of the methods of food processing being conducted by each respective technology. The results from this study lend to our understanding of the source of the initial shift from twined to coiled basketry, which can lead to further hypotheses about the environment and cultures present during this transition.

Lewis, Lauren [235] see Louderback, Lisbeth

Lewis, Cecil, Jr. [244] see Haffner, Jacob

Lewis, Quinn [175] see Friberg, Christina

Li, Kin Sum (Hong Kong Baptist University)

[42]

Attaining Accuracy and Precision of Measuring Containers in the Qin Dynasty

This presentation is a technical study to explore how Qin Dynasty bureaucrats attained accuracy and precision in producing and utilizing measuring containers, through which they implanted the awareness of the Qin Empire among the populace. We hope to first investigate what accuracy and precision meant to the Qin producers and users by focusing primarily on the measuring containers. Establishing standards of accuracy and precision was essential in all engineering and technological projects; this was extremely important in all grand infrastructure in the Qin Empire. We examine material features of the containers in details and attempt to ask how the producers attained them. Whether this was achieved by calculation of the volume of each container or rapid replication of models and/or molds of the containers constitutes our initial query. The measuring containers were also useful tools of indirectly

propagandizing the establishment of the empire. We further investigate how the Qin bureaucrats implanted the awareness of the empire by widely distributing the standard containers and displaying the royal edicts inscribed on them. We supply the field of the history of the Qin Dynasty with more solid evidence to see how the empire was built.

Li, Lavina [268] see Muros, Vanessa

Li, Xiuzhen (Emperor Qin Shihuang's Mausoleum Site Museum), Andrew Bevan (UCL Institute of Archaeology, London, UK), Yin Xia (Emperor Qin Shihuang's Mausoleum Site Museum) and Marcos Martín-Torres (University Cambridge)
[42]

New Insight into the Terracotta Army: Archaeological Discoveries and Post-excavation Research

Over recent decades, ongoing archaeological surveys and excavations have shed new light on the large quantity of fundamental new data about the Qin Empire, particularly within the mausoleum complex of the Qin First Emperor. Furthermore, post-excavation research has incorporated novel theoretical frameworks and methods. This paper is focused on the recent research on the Qin Terracotta Army using combination of spatial statistics, material analysis, and paleographic evidence to get new insight about Qin society, technology, individual behavior in mass production, and state level organization in early imperial China. The results contribute to a renewed understanding of the Qin Empire as a crucial period of state formation and empire building in ancient China.

[42]

Chair

Li, Xiuzhen (Emperor Qin Shihuang's Mausoleum Site Museum)

[94]

Discussant

Li, Xiuzhen [42] see Martín-Torres, Marcos

Libbon, Jonathan [77] see Burnett, Paul

Liebmann, Matt (Harvard University)

[46]

We've Been Asking the Wrong Questions about Early America

For decades archaeologists, historians, and other researchers have focused their efforts on a group of particularly enigmatic questions surrounding the European conquest of the Americas. What was the population of the Americas prior to European contact? How many Native Americans died as a result of post-1492 colonization? What diseases caused the demographic decline of Indigenous peoples in the fifteenth–seventeenth centuries? At the same time, these questions unwittingly served to rationalize inequalities in contemporary Native American life. It's time for archaeologists to turn our attention to a new set of questions that will help to dismantle enduring myths about early encounters in the Americas. These new questions cast light on continuing injustices perpetrated on Native Americans, the ways archaeology has contributed to those injustices, and the role archaeologists can play in their rectification.

Liendo, Rodrigo

[102]

Ancient Population History in the Palenque Region: The Problem of the Selection of Population Proxies

The Proyecto Regional Palenque (PREP) has recorded a total of 653 sites within an area of 650 km². Regional population ranges from 28,000 to 32,000 inhabitants. Mapping efforts and household excavations undertaken as part of the Proyecto Especial Palenque during the seasons of 1992–1994 identified 1480 structures at the site core with a probable population range of 6,000 to 8,000 residents. According to this estimate, population densities within city limits were quite high, 2,000 to 2,666 persons/km², a number only comparable to Mayapán or Copán's estimates. What is really striking for Palenque is the difference in terms of the sheer number and density of structures present within the site core compared to its immediate surroundings. Definitely, Palenque's urban core represents an environment qualitatively different from anything surrounding it. During the Balunte period (AD 750–820) the immediate city hinterland (approximately 37 km²) was a region with an extremely low population density (25 persons/km²). The space between main regional centers remained sparsely occupied. Using recently obtained lidar data, better chronological dating, and new excavation information, this presentation will focus on several issues relevant to the building of more robust ancient maya population estimates.

Lieske, Rosemary (Vanderbilt University)

[119]

Urbanism and the Conquest: Geophysical Survey at Ciudad Vieja, El Salvador

During the conquest of Mexico and Central America in the early 1500s, conquistadors exercised power on native inhabitants in many ways, including the manufacture and control of space in urban city-centers. The grid-system implemented throughout New Spain served as an ideological statement from which the Spanish Crown imposed new policies—political, economic, and religious—on indigenous populations (Kagan 2000:26–28). Thus, town planning was a form of social control (Soja 1989) utilized by the Spanish to exert and create social hierarchy within their towns. The first villa de San Salvador, El Salvador (AD 1528), known archaeologically as Ciudad Vieja, serves as an ideal site for the study of Conquest-era spatial organization and control. The use of geophysical survey at Ciudad Vieja has illuminated the ways in which indigenous residents were organized along the peripheries of

the town. The arrangement of native space—particularly for members of the indigenous auxiliary—at Ciudad Vieja may illuminate the degree in which these cultural groups were entangled in Spanish policy, or the ways these local allies negotiated power and autonomy within their communities.

Lightfoot, Kent (University of California, Berkeley)

[117]

Discussant

Ligman, Michael [194] see Webb, Dallin

Lilley, Ian [188] see Lowe, Kelsey

Lillios, Katina [35] see Priola, Victoria

Linares-Palma, Adriana (University of Texas, Austin)

[151]

Contradictions and Challenges on Conducting a Critical Archaeological Program at San Juan Cotzal, Guatemala

This presentation focuses on my recent fieldwork experiences at San Juan Cotzal, Guatemala. I question how appropriate “traditional methodologies” are in contexts of indigenous communities that have faced systemic historical violence. Given the violence, genocide, and historical invasions that have displaced people and stolen land in San Juan Cotzal, I underscore the threads that run through a participatory mapping of ancient settlements in Cotzal. My presence as “mu's” (a person that does not speak Ixil, the foreigner) created tensions and distrust among Ixil people, since I was the coordinator of the mapping project. I emphasize the necessity of having a clear political positionality within our profession, since archaeologists still represent a threat for owners of lands in which ancient settlements are located and also because locals associate archaeology to extractive industry in the region. Within this scenario, I provide a reflection about methodologies and their close relationship to coloniality of power in a country in which politics and discourses are predominantly racist.

[151]

Chair

Lincoln, Noa [252] see Peck, Katherine

Lind, Åsa [169] see Locker, Angelina

Linderholm, Anna (BiG Lab, Texas A&M), Frederik Seersholm (TrEnD Lab, Curtin University), Taryn Johnson (BiG Lab, Texas A&M), Michael Bunce (TrEnD Lab, Curtin University) and Michael Waters (Texas A&M)

[19]

Tracking the Younger Dryas Mass Extinctions Using Ancient DNA from Cave Sediments

The Younger Dryas (YD) is one of the most well-known examples of abrupt climate change in recent history. Despite considerable knowledge about the mass extinction that took place during this period, surprisingly little is known about the pace and scale of biotic turnover in response to the YD cold period and subsequent warming. It has been problematic to evaluate the response to these events due to the lack of available fossil and pollen records. To investigate the impact of the YD, a site situated south of the ice sheet that extends back across the YD is needed. Hall's Cave fits these requirements as it is unique Texan paleoenvironment archeological site with a deep YD sediment layer. Due to its location on the central Edwards Plateau, where the bedrock consists primarily of limestone, it is an excellent place for ancient DNA preservation. Based on ancient DNA extracted from a small number of bulk bone samples plus around 100 sediment samples taken from across the stratigraphy, we can describe rapid biotic shifts across the YD. Interestingly as plant diversity recovered after the YD, animal diversity did not. We can track the biotic shifts and correlate them to the fluctuating temperatures.

Linderholm, Anna [244] see Johnson, Taryn

Linderholm, Anna [51] see Jones, Lauren

Lindsay, Audrey (Center for Environmental Management of Military Lands [CEMML])

[231]

3D Modeling of Rock Art Sites: Applications for Federal Management Agencies

Recent studies demonstrate how Structure from Motion (SfM) photogrammetry provides a non-destructive, affordable, and accessible method to document and preserve rock art sites. This particular method is especially attractive for some Federal agencies, because it requires a limited amount of financial resources to complete and produces high quality results with a variety of uses. Vandenberg Air Force Base (AFB) in California recently initiated a 3D modeling rock art project, with the objective to build a 3D digital library for the fourteen Chumash rock art sites on base. This paper discusses how the Vandenberg AFB cultural resource program actively employs 3D modeling for continued rock art documentation and site management, as well as explore how this method and the resulting rock art 3D models may be used for further site monitoring, research, and public outreach.

Lindsey, Zachary (Texas State University)**[164]***In My Grownup Headdress: The Iconography of Childhood and Investitures in Classic Maya Art*

Proportionally-distinct children are rare in Classic Maya art, rarer still in monumental art. But images of children do exist, especially at Piedras Negras, Palenque, and Yaxchilan. In his recent book, Steven Houston discusses a ruler of Uuxactun who may have used his childhood as political propaganda. In this paper, I take his work further and suggest that all extant images of children in stone represent unstable dynasties. Either their kings could not trace direct descent to lineage founders or the dynasty lacked a male heir to serve as undisputed ruler. With this poster, I look at iconography and epigraphy of children in Classic Maya art. Rulers that used images of children in their iconographic suite may have been performing a long-term Gramscian War of Position in an effort to maintain their political dominance.

Linstädter, Jörg (Deutsches Archäologisches Institut)**[250]***Discussant*

Linstädter, Jörg [250] see Stempfle, Sabrina

Lipo, Carl [24] see DiNapoli, Robert

Lippert, Dorothy (National Museum of Natural History), Desirée Martinez (Cogstone) and Michael Wilcox (Stanford University)**[184]***Everything You Should Know about Indians but Were Afraid to Ask*

The practice of American archaeology, and the knowledge it produces, have impacts on the social, economic, and political policies and laws which affect Native American tribes. Recent SAA discussions on working effectively with tribes have largely focused on educating repatriation practitioners. Non-Native cultural heritage and resource managers, academic researchers, and museum staff who work with tribal heritage often lack basic knowledge about the nature of American Indian tribes. This poster will identify minimum standards of knowledge including but not limited to an understanding of legal rights, tribal sovereignty, tribal lands, the nature of THPOs, and traditional knowledge, among others.

Lira-Lopez, Yamile and Virginia Arieta Baizabal (Instituto de Antropología, Universidad Veracruzana)**[227]***La historia reciente en el estudio de las esculturas de la Costa del Golfo en el centro y sur de Veracruz: Dos casos de análisis*

Las esculturas prehispánicas pueden ser analizadas bajo distintos métodos, los cuales incluyen el estudio sobre su estilo, manufactura materia prima, la aplicación de técnicas científicas y la reconstrucción de su historia reciente. Este último, se vuelve valioso cuando se aplica a esculturas halladas de manera fortuita y/o fuera de su contexto arqueológico, lo que en muchas ocasiones ha provocado que sean injustamente juzgadas y tarden mucho tiempo en recuperar su lugar en los estudios arqueológicos. Consideramos que la responsabilidad académica demanda estudios que tengan como objetivo el trazo histórico de datos de procedencia, mediante el análisis de documentos, entrevistas y relatos a fin de resaltar y aportar información relevante para la validación o el rechazo de su autenticidad como pieza arqueológica. En esta ponencia se expondrán dos casos de estudio sobre la reconstrucción de la historia reciente de esculturas procedentes de la costa del Golfo: uno desarrollado en la región de las Grandes Montañas en el centro-oeste de Veracruz y el otro enfocado en la región Olmeca al sur del mismo estado. Ambas investigaciones tienen importantes repercusiones para el estudio prehispánico en la costa del Golfo, desde las perspectivas arqueológica y la histórica.

Lisboa, Rafaella [195] see Burns, Samuel

Liss, Brady (University of California, San Diego), Matthew Howland (University of California, San Diego), Anthony Tamberino (University of California, San Diego), Scott McAvoy (University of California, San Diego) and Thomas Levy (University of California, San Diego)**[147]***Archival Photogrammetry: Repurposing Excavation Photographs to 3D Model Previous Excavations in Faynan, Jordan*

Using photography to thoroughly document the excavation process is a common and long-standing practice on most archaeological excavations. Moreover, since the advent of digital photography, the number of photos captured of an excavation has generally increased. The Edom Lowlands Regional Archaeology Project (directed by Thomas E. Levy and Mohammad Najjar) has been using digital photography to record their excavations since its inception in 1997. While these original excavation photos were not intended for photogrammetry (using digital photos to produce 3D models), their rigorous photography strategy affords an opportunity to potentially repurpose this archival data for 3D modeling. In addition, these photos captured the excavation in its original state, before any damages of time. This poster explores this possibility based on archival photographs from the 2002 and 2006 excavations at Khirbat en-Nahas, an Iron Age copper smelting center in Faynan, Jordan. Using an excavation into a slag mound that has since collapsed as a case study, this poster presents the methods and results of this process along with one method for sharing this data using virtual reality. In doing so, it provides a case study of using archived photography to produce 3D models for the preservation and dissemination of archaeological sites/excavations.

Little, Nicole (Smithsonian) and Brice Vincent (Ecole française d'Extrême-Orient)**[205]***Identification of Bronze Workshops in Angkor Thom, Cambodia*

In 2012, archaeological teams associated with the Ecole française d'Extrême-Orient (EFEO) were able to uncover previously unknown bronze workshops at the ceremonial center of Angkor Thom in Siem Reap, Cambodia. Radiocarbon dating has confirmed the workshops were actively used during the eleventh to twelfth centuries at the height of Angkor civilization under King Jayavarman VII. Excavations for this project are now aimed at identifying the degree of metalworking (for both bronze sculptures and leaded roof tiles) at the ceremonial center during this important period. As a result, 251 soil samples were taken from 64 soil probes (and several test pits) in 2016 from across the ceremonial complex for processing and analysis by ICP-MS at the Smithsonian Museum Conservation Institute in Suitland, MD. The determination of heavy metal concentrations (including Cu, Sn, and Pb) in the soil will help researchers locate the extent of bronze statue and lead tile production at the ceremonial center of Angkor Thom. Preliminary results reveal concentrations of Cu and Pb in several areas in excess of 1000 ppm, far exceeding expected environmental levels.

Little, Terry [111] see McClintock, Thomas

Little, Walter**[157]***A Cultural Economy of Relief in the Aftermath of a Volcanic Eruption in Guatemala*

When the Fuego Volcano erupted on June 3, 2018, it was not surprising that the greatest damage and greatest loss of life occurred on the slopes that were well known to be the most hazardous. That two communities were completely obliterated with hundreds of dead and injured, while an elite golf resort was completely evacuated with just one death—that of a worker—speaks to the uneven ways in which information is shared and acted on according to class and ethnic lines. In this presentation, I use the concept of cultural economy as a way to think about how the vulnerability of where some live can be linked to entrenched ethnic and class politics and to tourism practices in general. In outlining how post-disaster relief plays out, I discuss the reasons why aid continues to fall short and, ultimately, fails to address the conditions that put certain people in the riskiest places to live. What, then, is the alternative? How can risk be reduced and more effective aid reach the afflicted in high-risk disaster zones? I conclude that the answers may be found by using archaeological models to better understand how contemporary people can mitigate disaster into the future.

Littman, Robert [192] see Silverstein, Jay

Liu, Xinyi [61] see Diaz, Lucia

Liu, Xinyi [35] see Sun, Yufeng

Liu, Yaxiong (UCL Institute of Archaeology), Marcos Martinón-Torres (University of Cambridge) and Kunlong Chen (University of Science and Technology Beijing)**[42]***Iron Production in State of Qin during Warring States Period: Exploration of the Technology and Its Social Impact*

Iron production in State of Qin during the Warring States period has been more or less overlooked in past research. In this paper, based on scientific examination of iron objects unearthed from the Guanzhong Plain, China, we were able to reconstruct the technological system applied for iron production in the Qin state during the late Warring States period. The results show that the overall production industry was well developed and standardized. Based on cast iron smelting as the primary technique to extract iron, different techniques such as controlled mold-casting, annealing and Chaogang (fining) were developed to cost-effectively produce an array of products for daily use, production activities as well as military purposes. The result suggests that during this period, the Qin state was actively engaged in developing and innovating iron production techniques, which may have contributed to the success of the unification war and the establishment of the Qin Empire.

Liu, Yu, Zhanwei Yue and Deming Kong**[94]***The Foundry Workshops and Craft Production of Bronzes in Late Shang Dynasty China (Thirteenth–Eleventh Centuries BC)*

Several foundry sites were found in Anyang city, Henan province, China, which is the capital of the late Shang dynasty (thirteenth–eleventh Centuries BC). From those excavations and many further research, we know the extent of the large manufacturing scale and outstanding casting technology which has profound and lasting influence on the subsequent development of the metal technology. The formation of piece-mold casting technology tradition, which is very different from mainly using the forging method and lost-wax process in the west Asia, is closely related to the craftsman's technological choice. Since bronzes production is a complex process, the investigation of casting technology, manufacturing sequence, and the organization of production would contribute to a better understanding of technology, economy, labor organization, social structure as well as cultural interaction in ancient societies of China. Through analysis of the excavation of foundry sites and thousands of bronze vessels, the craft production of bronzes in late Shang was studied, and the distribution and the management of the foundry workshops in Anyang were also discussed.

Livesay, Alison (Los Alamos National Laboratory)**[214]***Our Hearts Are Always from Here: Research and Collaboration at the Vigil y Montoya Homestead*

Sometimes our work takes us to unexpected places. My current postdoctoral project at Los Alamos National Laboratory focuses on

the Vigil y Montoya homestead, a Hispanic-owned homestead occupied from 1912–1942, and an under-represented period of history of the Pajarito Plateau in northern New Mexico. This research has been greatly enhanced through the chance meeting of a direct descendant and subsequent collaboration with the local lineal descendants. This poster summarizes the recent work at the homestead, including survey, excavation, artifact analysis, and drone work. I discuss the fascinating spatial patterns, issues with multiple occupations, important facts learned through exchange with descendants, and even how certain artifacts can be attributed to named individuals. Collaborations such as these are unparalleled as additional lines of evidence and have larger impacts on the field of historical archaeology and archaeology in general; most importantly highlighting the need for and returns of collaborating with descendant communities and constructing richer narratives of the past together.

Livesay, Alison [184] see Stewart, Carlyn

Livingood, Patrick (University of Oklahoma), Amanda Regnier (Oklahoma Archaeological Survey) and Scott Hammerstedt (Oklahoma Archaeological Survey)

[222]

The Great Raft of the Red River: Testing Impacts on Regional Interaction Using Cost-Distance Modeling

The Great Raft was an obstruction of logs and trees that formed in northwestern Louisiana on the Red River. By the 1800s it was a 224 km long obstruction, and archaeological evidence suggests it started forming between AD 1000 and 1400. Using cost distance modeling allowing for pedestrian and canoe travel, this paper will present the impact of the Great Raft on travel times between major Caddo regions and sites to the east. These differences will be compared against patterns of long distance exchange to measure whether the Great Raft had a measurable impact on regional histories and patterns of travel and contact.

Livingood, Patrick [107] see Hammerstedt, Scott

Liwosz, Chester (Mesa Prieta Petroglyph Project)

[25]

Selective Hearing: Toward a Puebloan Probability Model for Archaeoacoustic Landscape Properties Using Iconography and Geophysical Variables

Since the first forays into the use of databases and computational analysis of rock art compositions by Leroi-Gourhan in the middle of the twentieth century, digital archaeology applications have boomed, becoming a virtual necessity in twenty-first-century practice. Contemporary computerized tools for managing “big data” facilitate scholars’ unprecedented capacities to archive, manage, and swiftly analyze large volume datasets, shifting the biggest burden toward developing effective and informed attribute-based models as opposed to compiling sufficient sample sizes. This paper proposes a set of weighted criteria for identifying culturally significant landscape acoustics in the Puebloan Southwest based on experimental results at research loci selected from an existing database of documented petroglyph panels along the Rio Grande in northern New Mexico. A targeted sampling strategy was employed to sample locations suspected to have strong sonic significance, and a comparative sample of loci suspected to have little or alternative motivating factors. All locations underwent impulse response tests using percussion and sinusoidal sweeps and were virtually modeled in 3D to better understand the relationships of possible reflecting surfaces. Ultimately, this paper aims to improve research and sonic heritage conservation strategies by suggesting means of sifting through the ever-increasing large datasets available to twenty-first-century archaeoacoustics scholars.

Lizarraga Rojas, Beatriz [224] see Black, Valda

Lloyd, Lara (Mesa Community College)

[254]

From Site Tours to College Teaching: Applying Lessons from Working for the National Park Service into the Archaeology Classroom

Interpretive techniques assist with students’ abilities to forge intellectual and emotional connections to a given tangible or intangible. Because interpretation relies on multiple methods, the variety of learning styles and backgrounds of students in the classroom provides an ideal setting for applying interpretive techniques without placing the potential financial burden on students that may result from field trips. Teaching about places from the classroom may also provide a sense of authenticity not available at archaeological sites. Universal concepts such as survival and comfort provide students with a means for understanding an unfamiliar place while allowing them to connect with past lifeways. Through interpretative techniques, students can begin to reconstruct past lifeways with the goal of comprehending past cultures.

[254]

Chair

LoBiondo, Matthew (UC Santa Barbara)

[222]

Etowah Beginnings: New Research on the Multiethnic Origins of Etowah

Recent research has emphasized the role of culture contact as a process through which Mississippian culture originated. Indeed, this research has indicated that Etowah’s Mississippian beginnings appear to have emerged out of interactions among multiple different ethnic groups. Exactly who these groups were and how they interacted has remained obscure. A new project seeks answers to these questions through the analysis of pottery assemblages recovered between 1954 and 1958, from dense middens located in borrow pits excavated at the Etowah site. These middens have been interpreted as the remnants of large-scale-feasting associated with the founding of the site and initial mound construction. Preliminary results reveal that the pottery from these contexts can be linked to groups from northwestern Georgia and eastern Tennessee, with more than half of the study sample belonging to

non-Georgian traditions. This analysis will advance archaeological interpretations on the emergence of Mississippian practices at Etowah. Specifically, this research will address questions regarding the coalescence of disparate groups and how their interactions were negotiation and enacted. Additionally, the information gained from this study will be placed in a broader regional framework that will assist in macroscale discussions of the movement of people during the "Mississippianization" of Southeastern North America.

Lobo, José [26] see Sandeford, David

Locker, Angelina (University of Texas, Austin), Åsa Lind (University of Texas, Austin), Fred Valdez Jr. (University of Texas, Austin) and Deborah Bolnick (University of Connecticut)

[169]

Ancient DNA of Prehistoric Maya: Feasibility, Possibilities, and Implications for Research in the Neotropics

Genomics research has exploded in archaeological inquiry in recent years. Europe, the Arctic, and South America have provided most of the archaeological samples included in genomic research to date due to their tendency to have well-preserved human remains. Nevertheless, other regions have also identified questions that would be productively addressed with genomic data. The Maya area, for example, is rich in archaeological understanding and provides a wealth of information regarding the rise of social organization, complexity, and prehistoric lifeways; yet, preservation of human remains is notoriously poor. This has led to a severe deficiency in ancient Maya genomics research—which might elucidate (a) the role that kinship, lineage, and descent played in the social organization of households, communities, and regions, (b) the movement of and change within populations through time, and (c) how the ancient Maya are related to their Archaic predecessors, other ancient groups who lived contemporaneously around them, and extant populations. Here, we discuss preliminary mitogenome data from 49 prehistoric Maya individuals from northwest Belize to showcase the feasibility and benefits of genomics research in the Maya region. Based on this study, we offer guidance on methodological considerations, sampling strategies, and considerations for future research in the neotropics.

[169]

Chair

Lockhart, Jami (Arkansas Archeological Survey), George Sabo III (Arkansas Archeological Survey) and Jerry Hilliard (Arkansas Archeological Survey)

[107]

Geophysics, Discovery, and Changing Perceptions in the Protohistoric Arkansas River Valley

Radiometrically dated to the period of European contact, the protohistoric Carden Bottoms site in the Central Arkansas River Valley thrived for little more than a single generation. Thousands of museum-quality artifacts collected from the site over the past century indicate stylistic similarities to several distinct, yet distant, contemporaneous native cultures. This research comprises a landscape-scale, GIS-driven analysis informed by a site-wide, multisensor geophysical survey. These data were used to direct the complete excavation of multiple, sturdily-built, nearly-identical houses and other archeological features that elucidate this enigmatic and seemingly culturally-coalescent locale at the moment of impending colonization. Feature and artifact distributions are interpreted against the backdrop of the geophysical remote sensing data that led to their targeted discovery.

Lockhart, Jami [107] see Hammerstedt, Scott

Loehman, Rachel (U.S. Geological Survey)

[117]

Discussant

Loendorf, Chris (Gila River Indian Community)

[69]

Technological Implications of Atlatl Dart Raw Material Preferences along the Middle Gila River in South Central Arizona

The middle Gila region within the Phoenix Basin of south central Arizona is an important case study for considering projectile point raw material preferences because nearly all of the stone that was used to manufacture points had to be imported. Consequently, examination of temporal patterning in raw material usage provides insight to changes in stone preference that are not related to availability. These data show that higher impact strength materials were preferentially selected to produce atlatl dart tips, while finer-grained low impact strength stones were substantially more commonly used to make arrow points. This patterning may have occurred because the larger size of atlatl darts makes them difficult to transport, and this may have increased the importance of having fewer but more durable weapons. Furthermore, because of their larger size, dart points could be employed for a wider range of functions including cutting tasks, and this possibly also favored the use of more durable materials. Finally, impact energies differ between darts and arrows, and this theoretically could also have affected material choices.

Loendorf, Chris [229] see Morgan, Linda

Loendorf, Chris [229] see Plumlee, R. Scott

Lofaro, Ellen (University of Tennessee)

[153]

Discussant

Lofaro, Ellen (University of Tennessee) and Anne Amati (University of Denver)**[184]***Let's talk about a NAGPRA Community of Practice*

As we approach the 30th anniversary of the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), practitioners recognize the progress that has been made and acknowledge the vast amount of work left to be done. In order to meet that challenge, we need to increase capacity for NAGPRA implementation, improve overall engagement with ongoing NAGPRA work, and decrease misunderstanding and confusion still associated with NAGPRA. With the support of NAGPRA mentors and colleagues, the University of Denver Museum of Anthropology created the NAGPRA Community of Practice to advance implementation by bringing together people to connect and collaborate. Public discussions and a national survey have identified issues impacting NAGPRA implementation. For example, when asked if their museum or agency was respecting the rights of tribes under NAGPRA, 77% of museum survey respondents said yes but only 23% of tribal respondents agreed. These numbers highlight the lack of collaboration and communication that many recognize as one of the core issues impacting NAGPRA implementation. Learn more about the current state of NAGPRA implementation, survey results, and how you can get involved with the NAGPRA Community of Practice.

Loffler, German**[267]***The Lurin Valleys' Micro-politics: Ceramic Styles, Their Spatial Clustering, and Their Changing Distribution from the Middle Horizon to the Early Colonial Period*

In this paper I analyze more than 100 surface collections from the Lurin Valley in the central coast of Peru, paying particular attention to their ceramic components. The sites span from the Middle Horizon to early Colonial Period based on temporal association of key ceramic styles in each assemblage to known ceramics from those periods. Comparing ceramic style densities, in time, per fixed interval valley partitions, suggests a dynamic and changing political landscape in the Lurin. It can be inferred from the ceramics that the interval valley locations of importance seemingly shift from the low-valley—the area around Pachacamac during the Middle Horizon and Late Intermediate Period—to the upper valley with the dominant role of Sisicaya during the Late Horizon and early Colonial Period. The changing pattern speaks to the imperial machination influence of the Inca Empire on coastal communities as they encroached lowland valleys.

Lofthouse, Susan [50] see Ryan, Karen

Loftus, Emma [240] see Pfeiffer, Susan

Logan, Amanda (Northwestern University)**[46]***Food Security in Africa's Past Holds Lessons for African Futures*

In this TED-style talk, I argue that archaeology is critically important to building long-term histories of African food security. Long-term histories are important for several reasons. They challenge the notion that the African continent is a forever food-insecure continent by recognizing the strategies people used in the past to maintain high levels of food security. They help decolonize history by revealing the processes responsible for modern-day poverty and insecurity. And they provoke a different understanding of human responses to climate change. Together, these insights challenge us to ask a series of “what ifs” that radically challenge what we understand of African food security in the past and present, and urge us all to reframe very different kinds of futures.

Logan, Amanda (Northwestern University)**[114]***Discussant*

Logan, Lilith [259] see Bridgman Sweeney, Kara

Lohse, Jon (Terracon Consultants Inc.), Don Wyckoff (University of Oklahoma) and Marjorie Duncan (University of Oklahoma)**[23]***Calf Creek: An Exceptional Archaic Adaptation in the Southern Plains, North America*

Starting just after 6000 cal years bp, the Calf Creek horizon appeared in Oklahoma and Texas and quickly spread to cover over a half-million square miles in less than 250 years. Following an abrupt cold climate interval that may have been triggered by explosive high latitude volcanism, bison herds (*Bison occidentalis*) expanded their rangelands from the grassland prairies of western Oklahoma and Kansas as far south as northern Tamaulipas and along the Gulf Coast, and as far east as western Arkansas and Louisiana. Hunter-gatherers responded to this new resource by developing a highly specialized, over-elaborated biface technology centered around producing broad, triangular and deeply barbed spear tips (Calf Creek, Andice, and Bell types). Evidence for the heat treatment of bifacial preforms shows repeated heating episodes between reduction stages as a way to help ensure successful thinning and notching of these bifaces. The skill level required to fashion several of these bifaces suggests specialized production. In many respects, the Calf Creek horizon is exceptional in terms of Archaic adaptations, from volatile climate change to rapid cultural responses that may have included craft specialization.

Lohse, Jon (Terracon Consultants Inc.)

[90]

Discussant

London, Marilyn (University of Maryland) and Adam Fracchia (University of Maryland)

[188]

University of Maryland Forensic Aviation Archaeology

The University of Maryland Department of Anthropology has partnered with DPAA since 2016 for the recovery of American MIA military personnel. UMD faculty developed a summer field school through the Education Abroad program, with support from the UMD Department of Anthropology and the University of Vienna's Institute of Prehistory and Historical Archaeology. The course includes one week of classroom and hands-on instruction and five weeks of excavation. We have taken 24 U.S. students to work on two aircraft crash sites in Austria over the past three years. DPAA protocols are followed. Students learn archaeological techniques, recognition of human remains and probative evidence, basic forensic science, documentation, inventory, photography, and mapping. The faculty supervises and reviews all excavation and recovery, and provides DPAA with standardized reports, both daily and at the end of the field season. This partnership provides students with specialized training, the experience of traveling and living in a foreign country, and a chance to work with students from several institutions. The University of Maryland is honored to be a part of this important recovery program, and hopes to continue the work with its annual field school.

Long, Ashley [97] see Cowie, Sarah

Longstaffe, Matthew, Virginia Chiac and Meaghan Peuramaki-Brown (Athabasca University)

[178]

Daily Life in the Periphery: Results of 2019 Excavations at a High-Status Household at the Ancient Maya Center of Alabama, Stann Creek District, Belize

Situated in what was once a political and economic frontier zone in the eastern Maya lowlands, the ancient Maya center of Alabama, Belize, experienced rapid settlement and growth during the Late Classic to Terminal Classic period (ca. AD 700–900). The variable ecological and geological landscape of the region surrounding Alabama provided settlers access to a diverse array of unique and valued natural resources, including pine, cacao, granites, minerals, and unique clays. An ongoing household archaeology study aims to understand the role of exploitation of natural resources in structuring daily life at this community. As part of this study, results from a test pitting program at a high-status residential group in the Alabama periphery, are presented. Over 250 shovel test pits were excavated on a 5x5 meter grid, positioned to capture space between mounds as well as off-mound space beside and behind structures. Excavations identified a formally prepared plaza surface, non-architectural features, and located household middens. Preliminary analysis of recovered artifacts illuminates an array of economic, social, and political activities that took place at this household. The presented data contributes to an ongoing assessment of how broader socio-environmental factors intersected to guide community development at this “boomtown” settlement.

Loomis, Sarah (Harvard University)

[169]

Bloodshed and Bloodlines: Mortuary and Sacrifice at Los Guachimontones

This presentation examines the mortuary practices in excavated burials at Late Formative and Early Classic (300 BCE–400 CE) Los Guachimontones in Jalisco, Mexico. This site, with features such as shaft tombs and circular public architecture, is exemplary of the unusual regional cultural tradition of ancient West Mexico. An analysis of the mortuary remains found in both public and residential contexts across Los Guachimontones reveals the lineage-based hierarchical social organization that structures symbolism and ideology at this ceremonial center. Some burials are associated with wealth, status, and kinship, honoring and preserving the lineages that inhabited the center. Others are consistent with sacrifice, with specific groups of individuals (e.g., warriors, the deformed, and children) targeted for violent deaths, symbolic arrangements of remains, and possible human consumption. The choice of sacrificial offerings and the cosmological structures seen in the burial arrangements connect Los Guachimontones to ideologies found in the broader Mesoamerican sphere. The burials also demonstrate the emergence of a lineage-based hierarchy, capable of directing the construction of monumental architecture, alongside sacrificial and ceremonial activities to emphasize and maintain the power of the sacred center. These burials thus illustrate the emergence of cosmologically-supported lineal hierarchy at ancient Los Guachimontones.

Lopez, Andrea

[228]

Where Are We Five Years Later? A Reexamination of Gender Disparities in Publication Trends in Archaeological Journals

This project builds on the work of Dana Bardolph's 2014 gender research, where she analyzed gender publication trends across 11 major archaeological journals from 1995 to 2014, to assess any disparities between men and women in the number of publications per gender. Her research put statistical value on what many researchers have found before and since: men had higher rates of publication over women, often by wide margins. She argued this trend was a result of authorial behavior, not editor bias, as women were less likely to submit or resubmit publications for submission over male peers. In the five years since it was published, the difference in the number of women to men in archaeology has only grown, with women making up greater portions of graduate students and professionals, and it only gets larger with every passing year. Due to recent events, both in archaeology and the world-at-large, where light is being shed on gender inequalities and abuse, I reexamined the same 11 archaeological journals, evaluating whether publication trends have changed in the five years since Bardolph's survey, and where the future of archaeology is heading, from my perspective as a female graduate student on the cusp of my professional career.

Lopez, Andrea [147] see Porter, Keri

López, Francisco [163] see Hernández, Enrique

Lopez, Julieta [128] see Murakami, Tatsuya

López Bravo, Roberto (Universidad de Ciencias y Artes de Chiapas), Elizabeth Paris (University of Calgary) and Timothy Sullivan (University of Pittsburgh)
[168]

Coming through the Borders: Fine Orange Pottery, Trade, and Politics in Central Chiapas

The Early Postclassic was a period of changes for the peoples of the western Maya frontier: Tzotzil Maya, Zoques and Chiapanecs. Political entities located in the Jovel Valley of the Central Highlands and the Central Depression engaged in competing production and trade spheres. Recent INAA analysis of fine orange ceramics from three archaeological projects in these regions suggests that the Tzotzil Maya from Moxviquil produced and imported a highly diverse range of fine orange variations, using several different local clay sources, with an emphasis on Balancan Fine Orange forms and styles; they also imported large quantities of Provincia Plano-Relief produced in the Lower Grijalva Tabasco Lowlands. Conversely, their Zoque and Chiapanec neighbors from Chiapa de Corzo and other surveyed sites in the Middle Grijalva produced their own Fine Orange pottery. Sherds from these sites are all compositionally similar to each other, and do not show compositional overlap with Jovel Valley ceramics, suggesting the independent production of wares inspired by Balancan/Provincia vessels.

López Bravo, Roberto [150] see George, Miranda

López Bravo, Roberto [196] see Meanwell, Jennifer

López Bravo, Roberto [150] see Pacheco, Ellen

López Bravo, Roberto [54] see Paris, Elizabeth

López Bravo, Roberto [203] see Williams, Megan

Lopez-Finn, Elliot (University of Texas at Austin) and Elliot Finn (University of Texas, Austin)
[84]

Subtleties in Translation: Mexica References to an Imagined Teotihuacan

By the Postclassic Period, Teotihuacan and its cultural material represented an idealized past that existed before Mexica arrival. Archaeologists and art historians have traced the visual roots of deities like Tlaloc, Huehuetēotl, and Quetzalcoatl to this earlier period, suggesting that later artists continued to reference these iconographic programs to invoke the Classic Period and its mythos in the Postclassic imagination. In addition to archaizing references, Postclassic works integrated imagery associated with this ancient past in more subtle ways. The Xochipilli of Tlalmanalco offers one such case of subtle reverberations of Teotihuacan-style imagery into the Postclassic period. The talud tablero base that supports this deity effigy is not only a clever incorporation of that well-known architectural profile, but also a visual reference to sculpture bases found at Teotihuacan and sites influenced by its artistic program. However, this Postclassic base also incorporates distinct geometric bands with inward-curling features, a convention seen not at Teotihuacan but rather in material from the Preclassic and Classic Period coasts. In this presentation, I examine the Xochipilli of Tlalmanalco through the lens of archaism and translation, wherein the artistic repurposing of Preclassic and Classic Period visual motifs reveal contemporary understandings of an idealized ancient past.

López Mazz, José (Universidad de la República, Uruguay) and Federica Moreno (Universidad de la República, Uruguay)
[4]

Environmental management and emergency complexity in the lowlands of eastern Uruguay.

During the middle holocene (ca 5500 to 3000 years a.P) the lowlands of eastern Uruguay were subject to significant environmental changes, caused by variations in the level of the Atlantic Ocean and climatic conditions. These changes were important and involved high and low marine levels, as well as wet and dry climatic conditions. These changes impacted the economic organization of prehistoric populations that had to adjust their strategies in the way of occupying the geographical space and in the exploitation of plant and animal resources. After 30 years of research in the area, the available information allows us to explore different working hypotheses, which allow us to understand and explain the emergence of societies with different levels of social complexity. The study of settlement patterns and zoo archaeological information are particularly useful when studying human responses to changes in environmental conditions and the strategic role that flood lands seem to have played.

López Pérez, Eos [211] see Johnson, Lisa

Lopez Varela, Sandra (UNAM)
[204]

Mexico's Landscapes of Poverty Domination: Contesting Their Pertinence for Economic Growth through Impact Assessments

Memory is intimately linked with the landscape, as it creates a sense of place, by evoking people to remember social practices of lived histories through time. In eradicating poverty through infrastructure building and welfare policies, the Mexican government is suppressing the lifeways of indigenous communities that the government wants so much to preserve as emblematic of its identity. The paradox between preserving their past and life ways as emblematic of Mexico's national identity, and, at the same time, incorporating them into a model of modernization is contested here, by revealing how the commodification of the landscape leads to

the eradication of people's social practices and identities in a small community in Morelos. The discussion states that in preserving Mexico's heritage, archaeologists need to incorporate social impact assessments, if the well being of indigenous communities is a truthful interest.

Lorenz, Wayne, Kate Trusler and Jamie Akens

[85]

Mosaic Water Fountains in Pompeii

Water was a key element in the life of Roman citizens in Pompeii. Beautiful mosaic fountain structures were constructed in several of the houses and gardens in Pompeii. So far, there have been mosaic fountains excavated at 11 locations. Some of these were impressive in size, with the largest mosaic fountain located in the House of the Mosaic Columns measuring 12.5 feet wide by 14 feet high. A goal of Roman urban architecture in antiquity was the use of in-house, plumbed water to foster a pleasing sensual setting. The sights and sounds of water in the key living space areas conveyed by the mosaic fountains were used to create illusions of pleasure, wealth, and leisure. These fountains were adorned with glass tiles of multiple colors and arranged to display images of deities and other art. Seashells (both small conches and clams) and pumice stones were used in walls and aediculae, where bronze and marble statuettes spouted water into cascades and basins. With water as the main attraction to mosaic structure, the design of the alignment of piping and water pressure were evaluated in several mosaic locations, as will be shown in this paper.

Lorenz, Wayne [159] see Bernstetter, Jessica

Lorenz, Wayne [159] see Trusler, Kate

Lorenzen, Eline [64] see Szpak, Paul

Lothrop, Jonathan (New York State Museum)

[114]

Discussant

Lothrop, Jonathan (New York State Museum), Michael Beardsley (NY State Archaeological Association), Susan Winchell-Sweeney (New York State Museum), Andrea Lain (New York State Museum) and Mark Clymer (NY State Archaeological Association)

[190]

Powered by the Public: Investigating Paleoindian Archaeology in Central New York

Over his 30-year career as New Hampshire state archaeologist, Dick Boisvert had an enviable record of both promoting and researching archaeology across the state. Through the SCRAP program, Dick educated legions in the practice of archaeology, while investigating a series of important Paleoindian sites in the process. Modeled in part after Dick's approach, the New York Paleoindian Database Project has been actively researching the first peoples of the New York region, with a current regional focus on central New York. Our recording of Paleoindian artifact collections held in repositories and by private individuals has permitted development of geospatial datasets for modeling Paleoindian land-use in the region. In turn, this has led us to target specific sites for archaeological field investigation, with fieldwork supported almost entirely by the volunteer labor of avocational archaeologists and members of the general public. Here, we discuss our approaches to outreach and recent insights from this ongoing research on the Paleoindian peoples of central New York.

Loubser, Johannes (Stratum Unlimited, LLC)

[60]

Hidden in Plain Sight: Hexagonal and Avian-Shaped Petroforms in the Piedmont of Georgia

When viewed directly from above with a drone, a site complex with 56 piled stone features, located on a ridge toe east of the North Oconee River, Jackson County, Georgia, contains 16 features with hexagonal shapes and seven features that have outlines resembling raptors. Two thin-lined incised carinated bowls that are associated with piled stone features at the site date to the Late Mississippian Lamar Wolfskin phase (AD 1550–1670). Assessed in terms of the ethnohistorical record, the recovery of human remains from the main petroform at the River Glen complex suggests that it was a place honoring the physically departed. The presence of human remains and the unique shapes of the piled stone features prompted the Jackson County government to turn the wooded plot into a green space for public visitation and interpretation.

Loubser, Johannes [60] see Simek, Jan

Loubser, Johannes [8] see Whitley, Tamara

Louderback, Lisbeth (Natural History Museum of Utah, University of Utah), Kaley Joyce (University of Utah), Stefania Wilks (University of Utah), Lauren Lewis (University of Utah) and Nicole Herzog (University of Denver)

[235]

Identification of Ethnobotanical Genera and Families Based on Starch Granule Morphometrics

Food resources exploited by people in the past are often sorted into ecological guilds that reflect ecosystem composition (e.g., large mammals, small mammals, small seeds, acorns, tubers, etc.). These resource categories are further ranked by energetic returns in a diet breadth model that ultimately explains human dietary behavior. With the advent of residue analyses, many plant resources that were invisible in the archaeological record can now be revealed in the cracks and crevices of artifacts. Adding starch granules to a diet breadth model can dramatically alter conclusions regarding what resources were available and how people behaved in a

given ecosystem. But taxonomic identification of starch granules is still a challenge as there are no comprehensive surveys across important plant groups that have uncovered consistent diagnostic characteristics. This study aims to define characteristics for identifying starch granules of major plant genera and families (Poaceae, Apiaceae, Amaranthaceae, Liliaceae) based on systematic studies of granule morphometrics from modern reference materials. Although we have focused on western North America, these plant genera and families occur across the globe and have had dietary significance throughout prehistory.

Louderback, Lisbeth [177] see Lewis, Lauren
 Louderback, Lisbeth [245] see Wilks, Stefania

Loughlin, Michael [102] see Pool, Christopher

Loughran, Kailey (The University of Vermont) and John Welch (Archaeology Southwest)

[122]

Ancient (In)Security in the Upper Salt River Canyon, Arizona

Regional tension can inspire the construction of tactical sites in defensive locations, indicating community interest in monitoring landscapes and controlling access. Geographical, site location, and architectural data provide bases for considering decisions about why, where, and how people assert interests in security in response to inter-community or inter-regional relationship dynamics. Terrain analysis in ArcGIS enables assessments of geographical distributions of tactical sites, spatial scales of social insecurity, and possible relationships based on inter-visibility among sites. The spatial analysis described here uses site location data to calculate individual tactical site's visibility to evaluate how communities were organized around what and how much they can see. The relationships among inter-visibility, interaudibility, and viewshed provide insights into sociopolitical dynamics. Defensibility and line-of-sight criteria are used to understand relationships among fortified sites in the context of regional and interregional settlement dynamics from 1200 to 1400.

Lovata, Troy (University of New Mexico)

[214]

Manito Trail Archaeology: The Role of Archaeology in an Interdisciplinary Chicana Studies Project

The Manito Trail Project encompasses ongoing research by Chicana Studies, English, Documentary Film, and Archaeology scholars from the University of New Mexico, Arizona State University, and the University of Wyoming. The project records the lives of the Chicana diaspora who left New Mexico from the mid nineteenth through mid twentieth centuries to work, live, and sometimes permanently settle in Wyoming, Colorado, and Arizona. The project began as a study of oral and written histories focusing on the descendants of Manitos, but began considering material culture and attracted the attention of Archaeologists as it grew. This poster outlines how Archaeology—when based in community engagement and recovering life stories—can play a role in interdisciplinary research about Chicana and Hispanics, groups not often associated with people's view of the discipline. It considers: how Archaeology can empower Chicana when they have been ignored by or written out of other forms of history-making; how interdisciplinary research can be structured; the role of educating University students in larger research projects; and the ways that a Chicana focus might move beyond the application of Archaeology and change the discipline's conception of itself.

Love, Michael (Calif State Univ-Northridge)

[237]

Late Classic Occupation at La Blanca, San Marcos, Guatemala

La Blanca is best known as a Middle Preclassic center, but it also had a substantial Late Classic occupation. In 1972, Edwin Shook identified a kiln in the southern portion of the site, which he linked to Plumbate pottery production. Hector Neff explored the southern extreme of the site in 2005, using remote sensing and auger cores to collect more evidence of the Late Classic occupation. In 2017, excavations further explored the southern sector, finding evidence of residential and ceremonial activities.

Lovejoy, Owen [232] see Mraz, Veronica

Loven, Jeremy [193] see Miller, Kye

Lowe, Benedict [104] see Tanasi, Davide

Lowe, Kelsey (University of Queensland), Richard Martin (University of Queensland), Ian Lilley (University of Queensland) and Nick Bainton (University of Queensland)

[188]

Preliminary Investigations of American Service-Members in Papua New Guinea

The University of Queensland (UQ) has partnered with DPAA through the UQ Culture and Heritage Unit (UQCHU) to bring renewed focus to search operations for aircraft crash sites in East New Britain, Papua New Guinea, that have continued intermittently since WWII. The operation is challenging because often only a general idea of where aircraft were lost is known and East New Britain contains some of the most extreme terrain on earth. There are also both Allied and Japanese incidents reported, so sites are not always associated with U.S. aircraft. A small team of experienced PNG researchers recently visited East New Britain and established relationships with local villagers to facilitate access to their lands and ask about crash sites. A larger team followed up,

with results to be highlighted in this poster. This work builds on UQ's archaeological and PNG expertise to expand UQCHU's repertoire beyond Australia. We envision this search will create research opportunities between UQ, DPAA, and others such as the University of Papua New Guinea and the PNG National Museum. Such research addresses broader questions regarding archaeological technicalities of DPAA projects and the social and political dynamics of searching for missing American service-members in non-Western societies.

Loyless, Alyssa [26] see Klassen, Sarah

Loyola, Rodrigo [237] see Glascock, Michael D.

Lozada, Josuhé [204] see Sanchez, Fabiola

Lozada, Maria (University of Chicago), Danny Zborover (Institute for Field Research), Sylvia Cheever (Center for American Archaeology) and Erika Simborth (Independent Researcher)

[268]

The Excavations at Corral Redondo

This presentation will focus on the results of two field seasons of excavations at the site of Corral Redondo. The aim of the excavation was to answer the following research questions: 1) How and why did the site remain relevant through so many different iterations of human occupation? 2) How has the presence of the site affected the daily lives of local individuals and communities from its inception through to the modern day? 3) How were death and mortuary ritual conceptualized and incorporated within the site? And 4) How did the rise and fall of varying political powers in the valley become reflected in the ceremonial use of the site? Although limited in scope, our excavations revealed not only more spectacular Wari period (ca. 600–1000 CE) and Inka Period (ca. 1450–1550 CE) artifacts similar to those reported from the 1943 looting events, but also unexpected uses of the site in the Early Horizon period, the Colonial period, and even up to the present. These results will then be compared to other sacred ceremonial huacas and ritual practices in the Andes, past and present.

[268]

Chair

Lozada, Maria [268] see Silva Sifuentes, Jorge

Lozano, Beatrice [37] see Ramos Berrios, Alanis

Lozano, Sergi [48] see Fulminante, Francesca

Lozano, Stephanie (University of California, Riverside)

[84]

New Perspectives on the Teotihuacan Storm God

Teotihuacan was one of the largest precolumbian cities of Mesoamerica with extensive archaeological research. As a metropolitan city with multicultural barrios, it has often been compared to the present-day city of Los Angeles. This paper will highlight one of the most important gods found at Teotihuacan, the Storm God, which has been generally understood as an early form of Tlaloc. This paper will present new insights of the Teotihuacan Tlaloc and its association to power and political authority from the Preclassic to Late Classic Period analyzed from both the archaeological record and museum collections. Secondly, this paper will note the Teotihuacan Tlaloc's presence abroad in different Mesoamerican regions such as Oaxaca and the Maya area, offering new insights into the sociopolitical relationships that occurred between the multi-cultural city of Teotihuacan and other areas within Mesoamerica.

Lu, Jou-chun (National Taiwan University)

[267]

The Different Consuming Strategies between Political Center and Port City: A Case Study of the Distribution of Yue Celadon Types in Eighth–Eleventh-Century Japan

In ancient Japan, the trade of Chinese ceramics started from the eighth century. The most popular ceramics among the Japanese consumers was Yue celadon. Since Yue celadon is found with small number and limited spatial distribution of fine and coarse wares, this type of ceramics is usually considered by researchers as a luxury good which only reflected the political structures. Although the ancient Japanese government had priority to access trade ceramics, it could not monopolize the market. A free market for Yue celadon still existed. Thus, besides the influence of the political realm, it is also important to analyze the consumer preferences and how they reflect cultural and social structure. In this paper, I argue that we can understand ancient Japanese consumption of celadon ceramics more thoroughly by analyzing their function and art style, which previous scholarship fails to consider. This paper then uses a typology based on ceramics shapes linked with function and art style to illuminate both consumer preferences and various consumption strategies of the political center (Heian-kyō) and a port city (Dazaifu) in ancient Japan. It also explains the effectiveness of this research method in revealing the consumption patterns of ancient Japan.

Lubkemann, Stephen, Jaco Boshoff (IZIKO Museums of South Africa), Ricardo Duarte (Eduardo Mondlane University-CAIRIM), David Conlin (U.S. National Park Service Submerged Cultural res) and Paul Gardullo (Smithsonian National Museum of African American History)

[273]

Toward a Transformative Maritime Archaeology of the Slave Trade: Reflections from the Slave Wrecks Project Research Programs in Mozambique and South Africa

Drawing on work in Mozambique and South Africa undertaken over the last five years this paper examines how the Slave Wrecks Project's field research program, and its stakeholder engagement initiatives have come to inform each other in profoundly transformative ways. Our investigations of specific slaver shipwrecks have compelled a re-conceptualization of notions of "the site" itself and of research strategies for addressing the "Black Atlantic", while also underwriting complex reconsiderations of concepts of "heritage," "stake" and "stakeholder," "community", "engagement," and "memory." SWP's emerging approach has drawn from sources as diverse as South African critiques of apartheid's "heritage legacy" and Mozambican cultural scripts for contending with historical violence. We reflect on the signature approach emerging from this struggle to be "ethical social navigators" in contexts where stakeholders may disagree with researchers and each other about the past's meanings; about the merits of, or methods for, its recovery; and about the disposition of tangible vestiges of the lived past in the living present. In conclusion we call for a transformative maritime archaeology of the slave trade that will challenge maritime archaeology—both analytically and as a socially-embedded practice, critically contending with colonial and nationalist legacies that have implicitly shaped it.

Lubkemann, Stephen [273] see Boshoff, Jaco

Lucas, Virginia (University of Nevada, Las Vegas)

[76]

Faunal Exploitation Practices during the Pueblo II Period in the Moapa Valley: An Examination of Three Lowland Virgin Branch Puebloan Sites in Southern Nevada

Subsistence practices of the Lowland Virgin Branch Puebloans of the Moapa Valley, located in southern Nevada, are not yet well understood. This project examines faunal remains as well as marine shell from the Pueblo II component of the Steve Perkins site and the Pueblo II period sites of Elwood and Adam-2 (AD 1000–1150). Previous excavations at these three sites resulted in the recovery of several artifacts, including lithics, ceramics, turquoise, shell beads, and faunal remains that enhance our understanding of prehistoric occupations of the Moapa Valley. Faunal analyses should reflect procurement strategies indicative of a more sedentary lifestyle. This project aims to provide insight into the subsistence practices, exchange economies, and seasonality of the Lowland Virgin Branch Puebloans.

Lucas, Virginia [76] see Benedict, Laura

Lucero, Lisa (University of Illinois, Urbana-Champaign)

[70]

Discussant

Lucero, Lisa (University of Illinois, Urbana-Champaign)

[127]

Discussant

Lueth, Friedrich, Sebastian Messal, Anja Behrens, Guillaume Bruniaux and Victor Legrand

[107]

Large-Scale and High-Resolution Magnetometry of a Neolithic Landscape with Megalithic Monuments in Western France: Preliminary Results

Megalithic Monuments in Western France are embedded into a rich landscape. The size of undisturbed monuments does not allow minimal invasive excavations. These monuments are built with large quantities of local limestone of which it is assumed that they are quarried somewhere in the direct vicinity. At the same time it is desirable to detect contemporary settlements of which only a few are known to date. Within the research programme MONUMEN we have carried out a high resolution (12.5 cm distance) large-scale (800 ha) survey around two groups of Megaliths. Presentation will highlight the main results.

[107]

Chair

Luin, Camilo [130] see Vepretskii, Sergei

Luisi, Pierre [173] see Nores, Rodrigo

Lujan Sanders, Mariana [149] see Schleher, Kari

Lukens, William [8] see Ferraro, Joseph

Lulewicz, Isabelle (University of Georgia), Victor Thompson (University of Georgia), Karen Walker (Florida Museum of Natural History) and William Marquardt (Florida Museum of Natural History)

[59]

Local Manifestations of the Little Ice Age in Southwestern Florida, USA: A Zooarchaeological and Stable Isotope Perspective for Socio-Ecological Communities

Current research at the Pineland Site Complex (8LL33, etc.) and Mound Key (8LL2), two large midden-mound sites in southwestern Florida, provides new insights into the anthropological and environmental similarities and differences between two different bay systems at the onset of the Little Ice Age, ca. AD 1250. In this paper, we combine Bayesian statistical analyses of radiocarbon dates, zooarchaeological analyses of invertebrate and vertebrate remains, and stable oxygen isotope analysis of marine invertebrates. This provides a decadal view of the local changes occurring within these socio-ecological communities, how people navigated these changes in the face of the global climatic shift of the Little Ice Age, and how these signals compare to the global climatic characteristics of the Little Ice Age. Our research illustrates the need for developing localized paleoenvironmental datasets to examine the socio-ecological relationship at a scale relative to the human experience.

[59]

Chair

Lulewicz, Jake [264] see Doubles, Catherine

Lulewicz, Jake [77] see Duguid, Danielle

Lum, Koji [100] see Vilar, Miguel

Lundelius, Ernest [19] see Stafford Jr., Thomas

Luo, Shengqiang [94] see Lam, WengCheong

Lupo, Karen (Southern Methodist University), David Schmitt (RPA), Gwen Bakke (Southern Methodist University) and Nicolette Edwards (Southern Methodist University)

[22]

Faunal Remains from Farmer and Forager Sites in the Congo Basin in the Ethnoarchaeological Record

Archeologists have long sought methods for identifying different kinds of population interaction in the prehistoric record, especially among groups with vastly different power structures and economic strategies such as foragers (or hunter-gatherers) and food producers. Although zooarchaeological remains are a principle line of evidence used to identify forager-food producer economic interactions, archeologists lack an ethnoarchaeological framework where hunted wild faunal are the main source of meat consumed, exchanged and sold. In this paper we present comparative analyses of animal bones assemblages created by interacting forest foragers and farmers. Analyses show significant differences between these assemblages in NISP, taxonomic diversity and body part representation of marketable species. These results can provide an important line of interpretive evidence for the prehistoric record where wild prey are the main source of meat for foragers and farmers.

Lüth, Friedrich [107] see Ebert, Julia

Lüth, Friedrich [107] see Ruby, Bret

Luthman, Sarah [97] see Newton, Kathryn

Lutterbach, Austin (Purdue University)

[17]

GULmorph: A User-Friendly R Package to Digitize and Perform 2D and 3D GM

Morphometric analyses of anatomical remains and artifacts are common practice in archaeology. Landmark-based Geometric Morphometrics (GM) is a prominent approach used to quantify shape variation and its covariation with other variables. Current theoretical and methodological approaches allow GM analyses of traditional 2D and 3D landmarks, and of important 3D curves and surfaces representing anatomical and material structures of interest to archaeologists. Modern 3D scanning and photogrammetry easily render high-quality 3D point, curve, and surface data. Despite these advances, many studies using 3D GM methods only evaluate hypotheses about landmark configurations, excluding crucial shape information encapsulated in surfaces and curves. This occurs because most user-friendly morphometric software does not conduct GM analyses of 3D surface and curve semilandmarks. Here, we present GULmorph, the first user-friendly R package featuring a Graphical User Interface (GUI) to: 1) digitize 2D landmarks and sliding semilandmarks, as well as 3D landmarks and sliding curve and surface semilandmarks; and 2) conduct 2D and 3D GM analyses on landmarks, curves, and surface semilandmarks. GULmorph is easy to use and provides needed tools for archaeologists interested in quantifying complete artifact and anatomical shape variation, and in evaluating hypotheses regarding shape co-variation with other variables of interest.

Luzzadder-Beach, Sheryl (University of Texas, Austin)

[93]

Discussant

Luzzadder-Beach, Sheryl (University of Texas, Austin), Timothy Beach, Nicholas Dunning (University of Cincinnati), Samantha Krause and Jedidiah Dale
[206]

Using Lidar and Multiproxy Evidence to Assess the Role of Western Hemisphere Wetland Farming in the Early Anthropocene
 Early human land use and landcover changes influence many related earth systems including the carbon cycle, methane contributions to the atmosphere, changes in runoff, and sediment cycles. Human-induced disruption of the global hydro-climatic cycle in turn can influence global carbon sequestration, glacial mass balances, and sea level, all potential markers of the Early Anthropocene. This paper builds on our three decades of research in the Neotropics on ancient wetland agriculture to focus on synthesizing and modeling the potential influences and impacts of early wetland agriculture in the western hemisphere, based on our airborne lidar and ground level multiproxy evidence. We will compare the current records for the Mesoamerican neotropics with a synthesized and assessed western hemispheric record to better quantify the impact of ancient American agroecosystems on global atmospheric inputs of CO₂ and CH₄.

[206]

Discussant

Luzzadder-Beach, Sheryl [59] see Beach, Timothy
 Luzzadder-Beach, Sheryl [206] see Dale, Jedidiah
 Luzzadder-Beach, Sheryl [230] see Doyle, Colin
 Luzzadder-Beach, Sheryl [14] see Krause, Samantha

Lyall, Victoria

[109]

The Role of Precolumbian Collections in Contemporary Discussions of Identity, Heritage, and Home
 Spanning thousands of miles and nearly four millennia, precolumbian collections represent a constellation of voices and communities across time and space. As curators and keepers of these collections our responsibility lies in understanding their origins, their journeys, and ultimately their relationship to the present. How and why do these collections relate to contemporary communities? For many Latinx artists working on both sides of the border, precolumbian imagery remains a touchstone for a sense of place, heritage and identity. Unlike many of their predecessors who engaged with the material formally, many artists today investigate, interrogate, and amend the practices and vocabularies of ancient material to speak to their own journeys. Visitors connect the collections to current events, specifically the immigration crisis and the underrepresentation of Latinx artists and materials in museums across the country. In other words, as we consider the fate of these collections and their problematic origins, we must keep in mind the role these works play in contemporary discussions of identity, heritage, and home.

Lynch, Elizabeth (Florida State University)

[177]

Analysis of Catchy or Punny things: Analysis of Terrestrial Components at the Page-Ladson Site (8JE591), Northwest Florida, USA
 The Page-Ladson site on the Aucilla River is most well-known for its early Paleoindian and pre-Clovis components, but there are extensive Archaic and Woodland artifact assemblages that have also been discovered at the site. Little is known about these younger assemblages, but, recent terrestrial archaeological excavations during the 2019 Florida State University Field School season has yielded potentially significant evidence to further our understanding of post-Paleoindian use of Page-Ladson. Shovel test pits and other excavations have turned up artifacts such as fire cracked rock, chert flakes, projectile points, and pottery of Archaic and Woodland age, demonstrating that Page-Ladson was an important location on the landscape for at least 14,500 years. These materials, along with faunal materials from soil samples, are being analyzed in order to further our understanding of this locality's importance to pre-Colonial peoples of northwestern Florida.

Lynch, Joshua (Center for the Study of the First Americans)

[228]

Teaching Archaeology in situ: Culturally Responsive Education and Outreach on Saint Paul Island, Alaska
 Archaeology has been slow to embrace on-going developments in outreach and education paradigms, shifting toward student centered learning and culturally responsive pedagogy, particularly when working with underserved, remote, or rural native Alaskan communities. This paper presents the results of a multiyear education and outreach partnership between the Aleut Community of St. Paul Tribal Government and Ecosystem Conservation Office, the St. Paul school district, and professional archaeologists that culminated in the development of two college-level intensive Arctic archaeology courses delivered to students and community members on island in 2017 and 2018. Using hands-on experimental archaeology, object-based teaching, and hyper-local datasets, I developed a series of scaffolded and scalable student centered learning activities tailored to incorporate cultural knowledge of native Alaskan students and community members. The success of these education and outreach efforts is a direct result of presenting archaeological theory, methods, and data in the context of the unique and vibrant culture of St. Paul Island.

Lynch, Paige [233] see Ray, Erin

Lyons, Natasha [1] see Hodgetts, Lisa
 Lyons, Natasha [64] see Hodgetts, Lisa

Lyons, Patrick (Arizona State Museum)**[172]***Discussant*

Lyons, Patrick [129] see Crown, Patricia

Lyons, Patrick [172] see MacFarland, Kathryn

Lyons, Scott (University of California, Berkeley)**[234]***Reconstructing Ironworking on the Fifth- and Sixth-Century Osaka Plain*

Excavated sporadically for over thirty years, Ogata in Kashiwara City and Mori in Katano City are the largest-scale Kofun Period ironworking sites in Osaka Prefecture, Japan. Large numbers of forging slags have been unearthed from both sites, which alongside partially preserved hearth features, provide the bulk of evidence for ironworking. Following methods developed by French archaeometallurgists, novel analyses of these forge slags correlate different slag materials with different forging activities. This has allowed for more precise reconstructions of the kinds and range of ironworking activities at these two sites. This presentation combines these new analyses with new radiocarbon dates, charcoal analysis, and legacy data from prior slag analyses to illustrate the contrast in ironworking technologies at the two sites as well as differences in fuel preferences. Further, comparison with legacy paleoenvironmental data illuminates the relationship between the ironworkers at each site and their local forest landscapes.

Lytle, Whitney (University of Texas at San Antonio)**[158]**

The Ancestors You Choose: The Role of Predecessors from the Late Preclassic to Late Classic at Xunantunich, Group D Belize

Ancestor veneration was a cornerstone for Maya social organization and vital to the maintenance of hierarchy. As the Maya became more politically and socially complex, ritual practices involving ancestors also rose in complexity. Critical to the concept of ancestors is the recognition of the bond between ancestors and spaces. This paper explores the perceptions of "ancestors" through a case study of the Xunantunich, Group D eastern shrine and adjoining courtyard. Group D is an enduring example of power reflected in the creation and manipulation of space. The Late Classic period creators of Group D utilized the communal perception of an important ancestral space, a Late Preclassic hilltop shrine, to legitimize a new ritual location. All too often ancestors are characterized through kinship alone when reality indicates a multitude of definitions, manifestations, socio-political roles, and variety of ways in which they are incorporated in ritual spaces. Using evidence from Group D, I suggest ancestors should be understood as more complex characters which can be revered as ancestors of an entire community due to their significant contributions and not solely based on kinship ties.

[158]*Chair***Macaulay, Carol (Baylor University)****[235]***Interpreting Food Preparation Activities within a Central Texas Rockshelter during the Early Archaic Period*

The evidence of two food preparation areas, dating to the Early Archaic period, was encountered during the 2018 Baylor University Archaeological Field School at Barnhill Rockshelter #6, a large rockshelter located in Coryell County of central Texas. One of these areas consisted of two tethered features, a hearth and pit, as well as micro- and macro-botanical remains, stone tools, faunal bone, and hundreds of *Rabdotus* species snail shell. Charcoal recovered from these features produced a mean date of 7380 BP. The second work space was encountered below this surface and consisted of an earth oven, macro-botanical remains, stone tools, and discarded domestic debris. Wood charcoal used in this oven produced a mean date of 7445 BP. This paper will discuss what these domestic assemblages have revealed about the preparation of food within each of the areas.

MacDonald, Brandi (University of Missouri Nuclear Research Reactor), Izumi Shimada (Southern Illinois University), Marco Fernandez (Bruning Archaeological Museum, Lambayeque, Peru), Michael Glascock (University of Missouri Research Reactor) and Ursula Wagner (Munich Technical University, Germany)

[5]*Sicán Sociopolitical Organization in Lambayeque, Peru: Ceramic Compositional and Distributional Perspective*

We report major results of a recent chemical compositional analysis (INAA) of ceramic samples from multiple Middle Sicán (ca. 1000 CE) sites in the Lambayeque region on the north coast of Peru that offer important insights on the sociopolitical and territorial organization of the Middle Sicán polity. The analysis is an integral part of our cross-disciplinary testing of the multi-lineage collective governance model of the Middle Sicán leadership. The model postulates that the polity was composed of six elite lineages that shared the basic religious beliefs but each had its own distinct territory as well as workshops and other production setup to supply its valued craft goods including fine ceramic and precious metal items. Analyzed samples were derived from two distant, excavated ceramic workshops of Huaca La Pava and Sialupe as well as two contemporaneous loci within the Sicán capital, Huaca Loro and Huaca Lercanlech temple mound complexes. INAA results point to two different ceramic supply setups (Huaca La Pava and Sialupe) for these two temple complexes. We also compare the results with those of previously reported studies from the broad Lambayeque region.

MacDonald, Brandi [5] see McGrath, James

MacDonald, Brandi [105] see Shimada, Izumi

Macdonald, Danielle (University of Tulsa) and Lisa Maher (University of California, Berkeley)**[171]***Leaving Home: The Abandonment of Kharaneh IV*

For over 1,000 years, the Epipalaeolithic site of Kharaneh IV was a focal point on the landscape for hunter-gatherer groups, acting as an aggregation site for Early and Middle Epipalaeolithic peoples. Located in the eastern desert of Jordan, at the time of occupation the site was a lush wetland surrounded by a rich grassland environment, providing abundant food and resources for the site's occupants. However, over time the wetland began to dry up and by 18,600 cal BP Kharaneh IV was abandoned. In this presentation we discuss the final occupation of Kharaneh IV, linking the site's abandonment to increasing aridification of eastern Jordan. Environmental change is linked to social transformations and the eventual collapse of the Kharaneh IV as an aggregation locale.

Macdonald, Danielle [17] see Buchanan, Briggs

MacDonald, Douglas (The University of Montana)**[253]***Discussant***[253]***Chair***MacFarland, Kathryn (Arizona State Museum, University of Arizona), Arthur Vokes (Arizona State Museum, University of Arizona), Suzanne Eckert (Arizona State Museum, University of Arizona) and Patrick Lyons (Arizona State Museum, University of Arizona)****[172]***A New Fee Structure to Ensure Repository and Archive Sustainability*

For many decades, the Arizona State Museum (ASM) used a flat-rate curation model that proved unsustainable. It did not cover the costs of reviewing incoming materials for compliance with the Arizona Antiquities Act (AAA), preparing submissions for curation, or care in perpetuity. Furthermore, inadequate funding resulted in a storage space crisis and an intimidatingly large processing backlog, undercutting ASM's ability to meet its legal responsibilities and comply with ethical standards. An amendment to Arizona Revised Statutes § 15–1631 in 2016 required ASM to develop a new fee structure that would recover all costs and ensure ASM's ability to curate collections that, by state law, are in its care. The new fee structure, an effort-based model, coupled with an interest-bearing account designed to cover in-perpetuity curation costs, has been in effect for more than a year. In this paper, we discuss two ASM offices, the Archaeological Records Office and the Archaeological Repository, as case studies, describing for each: (1) the new fee structure in place; (2) the way the fee structure has been implemented; (3) the reverberating effects of this new, effort-based approach to curation at ASM, and; (4) the efficacy of the new model for in-perpetuity curation and AAA compliance.

Macias, José Luis [157] see Mendelsohn, Rebecca

Macias Quintero, Juan Ignacio [267] see Martínez de Luna, Lucha

MacIntosh, Sarah (University of Nevada, Las Vegas), Levent Atici (University of Nevada, Las Vegas) and Sachihiro Omura (Japanese Institute of Anatolian Archaeology)**[27]***Controlling Inherited Biases and Analytical Procedures for the Zooarchaeologist: A Case Study from the Central Anatolian Site of Kaman-Kalehöyük*

Zooarchaeologists have tackled numerous questions to reveal human-animal interactions in time and space. In addition to depending on animals for their primary products, that is meat, and secondary products such as milk, muscle-power, and wool, humans have used animals to establish and legitimize status and power, and to represent ideologies, identities, and ethnicity. In order to address such abstract concepts, however, potential sources of bias need to be first identified. In a previous paper, we identified a serious methodological dilemma, and bias, zooarchaeologists often face when sorting artifacts/ecofacts in the field. In our case study, bone artifacts from the Bronze Age (ca. 3000–1200 BCE) site of Kaman Kalehöyük were separated from the rest of the faunal assemblage; thus, taxa representation and body part percentages and ratios were greatly misrepresented in the faunal record. This paper expands upon that research agenda by analyzing new archaeological contexts and incorporating other researchers' datasets. By examining more material, we aim to determine how significant the changes are with the inclusion of new data when analyzing the distribution of principle taxa and the ratio of body parts. Finally, we probe how these new results affect subsequent interpretations of past human behaviors at the site.

Mack, Jennifer [172] see Noldner, Lara

Mack, Karen**[190]***It's in the Pits: New Insights into the Eddington Bend Site, Penobscot River, Maine*

Eddington Bend is one of the largest Precontact period archaeological sites in Maine where people returned for over 5,000 years. It sits 15 m above the Penobscot River on an early post-glacial terrace composed primarily of sand that offers sweeping views of the

river and easy access to a large set of falls or rapids created by a bedrock outcrop to the north. Hundreds of cultural features have been excavated at the site. A sample of 20 of them studied in 2018 shows that the features fall into five groups including shallow trenches, shallow fire pits, deep trenches, deep fire pits and pit features. These groups do not appear to be morphologically distinct by cultural time period. Functionally they appear to be related to fish and vegetable processing. Analysis of the faunal and floral content of these features revealed that river herring and sturgeon were important resources. Native people were not only harvesting river herring and sturgeon, but they may have been cultivating gourds as well. A fragment of *Cucurbita pepo* identified in one floral sample was AMS dated to 3,790±30 BP and provides evidence of this cultivation. This is the earliest reported gourd cultivation on the Penobscot River.

Mackay, Alex [11] see Phillips, Natasha

Mackertich, Samantha [35] see Barrett, Sophia

Mackie, Madeline (University of Wyoming) and Todd Surovell (University of Wyoming)

[180]

Early Paleoindian Hearth-Centered Activity Areas: Identifying Invisible Hearths and Their Spatial Structure at the La Prele Mammoth Site

In the archaeological record, relatively few Early Paleoindian hearth-centered activity areas have been identified. This is likely due to these sites' significant age, poor preservation, and often short occupation spans which can easily obscure characteristics generally used to identify hearths (e.g., charcoal staining, oxidation). However, even in the absence of these characteristics, hearths can still be identified during post-excavation analysis of burned artifact and bone distributions. Here we apply this technique to the La Prele Mammoth site, a Clovis mammoth kill/scavenge with associated activity areas, located in Converse County, Wyoming. The associated activity areas appear to be domestic spaces based on their artifact assemblages which include chipped stone tools, faunal remains, ocher, bone needles, and a bone bead. We first identify likely hearth locations using burned artifact distributions. Then, we examine the spatial structure of the immediate hearth area using a modified ring analysis. This study offers the rare opportunity to understand how Clovis peoples used hearth-centered spaces.

Mackie, Madeline [270] see Herron, Molly

Mackie, Madeline [244] see Ricketts, Macy

MacLellan, Jessica (University of Arizona)

[128]

Domestic Rituals in Unstable Times: The Protoclassic and Early Classic at the Karinel Group, Ceibal

The Karinel Group is a residential area near the center of Ceibal, Guatemala. During the Protoclassic period (c. 75 BC–AD 300), similar caching rituals were carried out at the Karinel Group and in the Central Plaza, showing the group's residents were closely involved in public rituals. Similar domestic and public caches, often involving many ceramic vessels and limestone spheres, are characteristic of the Protoclassic period across the lowlands. Like many lowland Maya centers, Ceibal experienced a major population decline and political collapse at the end of the Protoclassic. The Karinel Group is one of few areas of the site occupied throughout the Early Classic (c. AD 300–600). In the absence of a strong political-ceremonial center, the residents stopped caching pottery and experimented with new rituals. A deposit of two decapitated domestic dogs was created. A human skull was buried with other objects. Structure 47, a household shrine or temple with origins in the Preclassic, was buried. The residents transformed their ritual practices and spaces along with their relationship to the public center. Interestingly, Ceibal's royal dynasty appears to have been founded during this time of instability.

MacMillan, Vincent [60] see Palonka, Radoslaw

MacMillan, Vincent [147] see Varen, Mark

Macrae, Scott (Trent University), Gyles Iannone (Trent University), Kong Cheong (American University), Nyein Chan Soe (Mandalay University) and Naing Soe (Yangon University)

[28]

Surveying Dispersed Urbanism in Bagan's Peri-Urban Zone

Throughout Southeast Asia, settlement pattern studies employed around Classical Era cities are increasingly classifying residential surveys as dispersed urbanism. Dispersed urbanism, alternatively known as agrarian low-density urbanism, has been broadly defined as the intermixing of both urban and rural settlement patterns and land-use. Ancient cities prescribing to these settlement patterns exhibit larger monumental centers immediately surrounded by a peri-urban zone consisting of continuous homogeneous mixture of settlement and agriculturally modified lands. The practice of identifying this style of settlement pattern offers an interesting opportunity to develop new and tailored survey methodologies. In this paper, the methodological approach implemented by the IRAW@Bagan research team to explore the peri-urban zone surrounding the Classical Burmese capital of Bagan (eleventh to fourteenth centuries CE) will be presented. Defining the linkage between the survey methods employed and the hypothesis of dispersed urbanism provides an opportunity to not only address methods but also the concept. Methodological approaches will be highlighted during the presentation through the preliminary results of reconnaissance, transect survey, and intensive surface collection carried out during the 2019 field season.

[28]

Chair

Macrae, Scott [28] see Iannone, Gyles

MacWilliams, Arthur [156] see Zaragosa, Gabriella

Mader, Christian (University of Bonn)

[259]

The Archaeology of Dependency: A Theoretical and Methodological Framework with an Application in Precolonial Peru

In archaeology and related disciplines, systems of asymmetrical interpersonal dependency have been mostly investigated in the form of slavery in the "Old World" and in the transatlantic slave trade (sixteenth–nineteenth century). This paper introduces the new concept of resource dependency, which allows to analyze types of dependency in spheres such as the precolonial Americas. Resource dependency is defined by two significant sorts of strong structural dependency within a larger ecological and sociopolitical setting. The first sort concerns the dependency of people on resources, which is a crucial basis for the second sort, the dependency between humans. The methodological key for the examination of resource dependencies is a holistic approach combining several lines of archaeological and, if available, textual evidence. Three important lines of archaeological evidence are (1) the analysis of landscapes, architecture, and households, (2) the analysis of artifacts and ecofacts, and (3) the analysis of funerary contexts. The exploration of resource dependencies along several lines of evidence has pronounced interdisciplinary components, for instance by applying natural scientific analytical techniques and aspects of economic theory. As a case study serve the Palpa valleys in southern Peru. First results are exemplified by the Formative Paracas culture (800–200 BCE).

Madrid i Fernández, Marisol [196] see Buxeda i Garrigós, Jaume

Madsen, David [170] see Des Lauriers, Matthew

Magargal, Kate (University of Utah)

[15]

Limb for Limb: Risk and Firewood Acquisition in the Southwestern United States

There are numerous dynamics of risk associated with acquiring any resource. The risk of investing time unsuccessfully, of incurring too great an opportunity cost, and of dangers to life or limb when venturing forth all come into play. How do these different types of risk trade-off and how does a human in need of said resource navigate these dynamics? Firewood is one such resource where scarcity and intensity of need can combine to create a landscape of risk for those engaged in its harvest. This ethnographic study examines firewood harvest among Diné in southern Utah. In this case, woodlands are located a large distance from home sites, causing wood haulers to face several different elements of cost and risk in the pursuit of firewood. Using a combination of quantitative and qualitative ethnographic data, an analysis of the risk landscape for wood haulers is presented. Given the importance of firewood throughout human history, understanding the risk landscape of firewood will have many implications for archaeological interpretation.

[15]

Chair

Magargal, Kate [236] see James, L. Brock

Magargal, Kate [195] see Vernon, Kenneth

Maggs, Tim [240] see Pfeiffer, Susan

Magoon, Dane (University of Leicester)

[251]

Powhatan's Pearls: Power, Prestige, Profit, and Identity in Coastal Virginia during the Late Woodland and Contact Periods

While copper and shell beads have been focal topics within the region, as items of Native adornment and power during later prehistory, a review of early historic accounts indicates that freshwater pearls may have been the most valued of all such commodities, during both life and death. Obtained locally, from the expansive waters of the inner coastal plain region, freshwater pearls may also have served as a symbol of regional identity. These pearls were subsequently targeted by English settlers as a potential means of making the Virginia Company profitable during the initial years of colonial settlement, underscoring their persistent presence in the historic record. In retrospect, the quest for freshwater pearls may have been a driving force behind Native American settlement within the inner coastal portion of the James River drainage during the Middle and Late Woodland periods, based upon a potential knowledge of former Hopewell economies, extra-regional trade networks, and the ideal habitat required by freshwater mussels, a resource often viewed as a mere survival food. While ephemeral in the archaeological record, this presentation investigates the presence and varied roles of freshwater pearls as contested objects within the historic record and at archaeological sites in coastal Virginia.

Mahan, Chase (University of Wyoming), Sarah Allaun (University of Wyoming), Todd Surovell (University of Wyoming) and Marcel Kornfeld (University of Wyoming)

[180]

Redating the Sheaman Clovis Site, Wyoming

The Sheaman site, located in eastern Wyoming near the Agate Basin site, has been represented as one of only a few Clovis campsites in North America. However, problematic dating of the site has resulted in questionable Clovis affiliation. A total of sixteen radiocarbon dates have been used by various researchers to argue for or against that affiliation, with some research suggesting a younger Paleoindian Goshen or Agate Basin affiliation. This paper presents the results of radiocarbon ages obtained from calcined bone, a relatively newly accepted method producing consistently reliable radiocarbon dates. In contexts where charcoal or bone produce inconsistent radiocarbon dates, calcined bone can serve as a viable alternative dating method.

Maher, Lisa (University of California, Berkeley), AJ White (University of California, Berkeley), Jordan Brown (University of California, Berkeley), Matthew Jones (University of Nottingham) and Christopher Ames (Wollongong University)
[140]

From Wetlands to Deserts: The Role of Water in the Prehistoric Occupation of Eastern Jordan

In the Azraq Basin of eastern Jordan, dramatic landscape changes from wetlands to desert resulted in major shifts in settlement and landscape use over time. Within the last decades, several springs in the central oasis have ceased to flow, with devastating effects for the local communities of this once rich marshland. In a similar balance between climate change and human demands on the landscape, palaeoenvironmental research here suggests conditions have changed throughout the Pleistocene and into the Holocene, with significant impacts on human population movements and landscape use. For example, recent work at the Epipalaeolithic site of Kharaneh IV (and others nearby) indicates abandonment of this intensively used aggregation site with desertification at the end of the LGM. In contrast to neighboring areas, where increased temperatures brought about climatic amelioration, here it brought increased rates of evaporation, shrinking wetlands and leading to the disappearance of associated resources. The occupants of Kharaneh IV reconsidered their use of this locale for large-scale settlement and, in fact, such aggregation sites disappear entirely from the region. Here, we examine how occupants of the basin throughout prehistory experienced similar situations to modern-day inhabitants of the region, where water is an increasingly dwindling and precious resource.

Maher, Lisa (University of California Berkeley)
[219]

Discussant

Maher, Lisa [171] see Macdonald, Danielle

Mahoney, Maureen (Seminole Tribe of Florida THPO) and Domonique deBeaubien (Seminole Tribe of Florida THPO)
[192]

Hearing the Native Voice through the Colonial Narrative: A Retelling of Seminole History and Ancestry

North American archaeology has been plagued since its inception with colonial narratives that ignore histories that run counter to conventional academic viewpoints. While the archaeology of South Florida originally followed this pattern, in recent years it has become more focused on a historical narrative that is inclusive of Native voices. The Seminole Tribe of Florida Tribal Historic Preservation Office has been working to rewrite this narrative through the intensive examination of select sites located on reservation lands. New archaeological evidence from tree island hammocks clearly reinforces Tribal belief that the Seminoles and their ancestors have occupied the ancestral lands of Florida for thousands of years. This paper will present the concept of a continuous Seminole occupation of Florida, and how this is reflected in the archaeological record.

Mahumane, Cezar (Eduardo Mondlane University)
[250]

New Approaches to Protect Endangered Shipwrecks around Mozambique Island

The end of commercially oriented activity aimed at Underwater Cultural Heritage at Mozambique Island presented the opportunity to fully assess what can still be researched and plan strategies to effectively protect this heritage following the UNESCO best practices proposed on the 2001 UNESCO Convention on the Protection of Underwater Cultural Heritage and its Annex. In the last two years some steps have been taken regarding research, protection strategies and the establishment of basic conditions for stabilization of endangered wreck sites. This paper highlights some of the major activities developed at Mozambique Island in the last two years in terms of strategies to effectively protect Underwater Cultural Heritage. These activities have been undertaken by the Department of Archaeology and Anthropology at Eduardo Mondlane University in collaboration with international partners and the Mozambique Island community.

Mailler, Mary and Spencer Mitchell (UC Santa Barbara)
[239]

Geospatial Analysis of Historic Maps Further Confirms Etzanoa Was Located at the Mouth of the Walnut River in Arkansas City, Kansas

ABSTRACT: This spatial analysis applies ArcMap's various geo-referencing and viewshed analysis tools in confirming that the site of a historic encounter occurring in 1601 between Juan Oñate (the Oñate expedition) and native Etzanoans occurred at the mouth of the Walnut River, in Arkansas City, Kansas. The analysis relies on a study of expeditioner's notes discussing the encounter and two period maps produced for Spanish officials in Mexico City—the Miguel Map, drawn by a native captive of Oñate's and a transcription of the pilot's map, referred to as the Martinez Map (both dated to 1602). Bringing the two maps into ESRI's ArcMap 10.6.1 GIS spatial environment allows for the controlled scaling of both maps and an aligning of their geophysical features, including salt plains and river systems, to geophysical features observable in satellite imagery taken over Kansas and neighboring states. Following this study with a viewshed analysis of the river systems, their banks and ravines in Kansas affirms that the expeditioners first sighted the Etzanoa settlement at the mouth of the Walnut River, in Arkansas City, in 1601.

Maisel, Mary (Cardno)**[213]***At Fort Brooke Tampa, Florida, Trash Pits Are People Too*

Fort Brooke, a historic fort site occupied between 1824–1882, is the most significant historic component in Tampa, Florida. Pit features are the most commonplace remains of the fort, found in almost all Fort Brooke contexts across town, but they tend to lose precedence to privies, cemeteries, other structural remains, or even post holes. Focusing on these pit features, we find these commonplace remnants of Fort Brooke to be just as valuable to site interpretation, because they are often compact, discreet, and equally as important for the materials we prize for their diagnostic quality. They can expose details about the lives of individuals contributing to these trash pits. Wine seals, pipe stems, teapot spouts, faunal remains, shells, among others detail the material consumption of individuals residing in Fort Brooke era Tampa.

Majere, Evelyn [82] see Gillispie, Thomas

Majewski, Teresita (Statistical Research Inc.)**[132]***American Recovery and Reinvestment Act Nationwide Section 110 Work*

Work funded by the American Recovery and Reinvestment Act of 2009 through the U.S. Army Corps of Engineers, St. Louis District consisted of 40 individual delivery orders for “shovel-ready” projects within 18 months. The work provided the government’s three prime contractors with opportunities to gain new experience and build relationships with every Corps District in the continental United States, and projects were conducted in more than 30 of the lower 48 states. In addition to nearly 60,000 acres of archaeological survey, contractors and their small business team members completed site evaluations, geoarchaeological and condition assessments, National Register nominations, GIS analysis and modeling, curation, and other tasks, such as supporting the Veterans Curation Project. Accelerated timelines for projects spurred development of innovative fieldwork and management strategies to meet the government’s requirements for high-quality archaeological work and contractual accountability. The projects also made valuable contributions to our understanding of our collective heritage, particularly in some Corps Districts where knowledge of regional prehistory and history was incomplete. This work was a lifeline for many cultural resource management companies during the recession, and is a testimony to the creative thinking of Dr. Michael K. “Sonny” Trimble and his staff.

Majewski, Teresita (Statistical Research Inc.)**[247]***Discussant*

Makarov, Nikolai [173] see Kim, Alexander

Maki, David (Archaeo-Physics, LLC), Dianne Desrosiers (Sisseton Wahpeton Oyate THPO) and Sigrid Arnott (Sigrid Arnott Consulting)**[127]***Thunder Beings and Human Interactions: Lightning-Induced Magnetic Remanence in the Ancient Landscape*

Cultural representations and stories show lightning beings are significant forces in the indigenous worldview. In the Mni Sota Makoce (Minnesota River region) the Dakota continue to welcome the wakinyan (thunder beings) in ceremonies recognizing them as earth renewal forces. Magnetic field gradient survey of selected sites within this region has provided a means of mapping lightning strikes in cultural landscapes, and the resulting data have graphically demonstrated the power that thunder beings focus at specific landforms. Magnetic data from burial mound groups have documented lightning induced anomalies closely associated with the mortuary landscape—both before and after construction. Within this context, this paper summarizes the physics of lightning-induced magnetization and presents examples of thunderbird representations and burial sites associated with lightning strikes to explore how indigenous peoples in the Upper Midwest interacted with supernatural thunder beings in their cultural landscape. Literature shows interest in lightning and thunder was spatially widespread over a deep time span in the Americas. In some areas, observations of lightning beings inspired people to explore magnetism, and perhaps even develop the ability to locate and map lightning strikes. Understanding this practice can assist preservation of places where past communities interacted with, attracted, or observed thunder beings.

Makin, Mike (Stantec)**[251]***The Problem with Prehistory: A Case for Precolonial Archaeology*

Traditionally archaeologists working in the United States divide the continent’s chronology into two major periods: Prehistoric and Historic. I argue that these periods would more accurately be called precolonial and colonial. The current dichotomy implies that prior to colonization, there was no collective cultural memory in the region. It creates a world where Indigenous societies never changed and people simply existed with no interest in their pasts or futures. The archaeology of persistently used places in the Chesapeake region suggests otherwise. Archaeology sites like the Hatch Site (44PG0051) suggest history existed in the region long before colonization. Native people came to Hatch for hundreds (possibly thousands) of years and carried out elaborate feasting rituals. The way ritual artifacts were deposited at the site suggests a method of creating social memory that is markedly different from the Western historical tradition. It implies precolonial people understood time as cyclical rather than linear. A different method of understanding the passage of time, but a means of creating a record all the same. The term ‘prehistory’ is inaccurate and should not be used when discussing America’s precolonial past.

Maldonado, Antonio [74] see Gayo, Eugenia

Maldonado, Blanca (El Colegio de Michoacán)

[204]

Ethnoarchaeological Research of Traditional Charcoal Production in Central Michoacán, Mexico

Charcoal production along the region known as Bishopric of Michoacán, which included the modern states of Michoacán and Guanajuato, as well as parts of Jalisco, Colima, Guerrero, and San Luis Potosí, in Mexico, has changed very little since the arrival of the Europeans. The expansion of this traditional craft is linked to the development of the colonial mining industry from the early sixteenth century to the turn of the nineteenth century. The exploitation of mineral resources, including copper, gold, and silver, involved the use of charcoal to produce heat at numerous points along the extractive process. Charcoal makers represented a socially and ethnically diverse group whose composition captures the complex and diverse nature of the incipient colonial society. Today, charcoal represents an important source of energy in Central Michoacán and its surrounding regions; it is used primarily by the residential and food vending sectors. An ethnoarchaeological approach has been developed combining systematic research of written and oral data, as well as archaeological evidence, to investigate charcoal production in the region, and generate a historical and current assessment. The purpose of this paper is to present the preliminary results of this ongoing research.

Malhi, Ripan [82] see Lanoë, François

Malin-Boyce, Susan [132] see Smith, Mark

Mallick, Soumen [50] see Bielenberg, Aliosha

Malo, Erika (Project Archaeology), Courtney Agenten (Minnesota Project Archaeology), Jennifer Knutson (University of Western Florida) and Erin Pritchard (Tennessee Valley Authority)

[193]

School of Rock Art! Getting CRM into the Classroom

Project Archaeology is a nationwide K-12 archaeology education program. A major part of the program is the creation of inquiry-based curricula and its delivery through professional development. These aspects of Project Archaeology are supported through multiple avenues, including mitigation. Curricular materials provide an opportunity to produce mitigation and outreach products that give back to communities on a long-term basis. These materials can encourage archaeological stewardship and cultural understanding while building relationships between agencies and communities and fulfilling classroom needs. Descendant community members, archaeologists, and educators are essential participants in making powerful curricular materials. In 2016, Project Archaeology and the Tennessee Valley Authority (TVA) embarked on a public outreach project—Project Archaeology: Investigating Rock Art and its regional investigation, Investigating Painted Bluff. This was a completely new third through fifth grade curriculum series. The project continues with workshops being offered annually and the curriculum message of preserving our shared archaeological heritage is being taught in classrooms in Alabama and throughout the nation.

Mandel, Rolfe (Kansas Geological Survey), Mark Mitchell (PaleoCulture Research Group) and Michele Koons (Denver Museum of Nature & Science)

[198]

Geoarchaeology of Magic Mountain (5JF223): A Stratified Site on the Front Range of the Southern Rocky Mountains, North-Central Colorado

The Magic Mountain site (5JF223) in Golden, Colorado has long been recognized as one the most important stratified archaeological sites on the Front Range of the Southern Rocky Mountains. For decades, the site's well-preserved middle and late Holocene record served as a comparative touchstone for systematizing the archaeological record of the South Platte River Basin. Early, Middle, and Late Archaic artifacts have been recorded at Magic Mountain, but the site's richest and most extensive cultural deposits represent multiple Early Ceramic period occupations dating to ca. 1800–800 BP. Although archaeological investigations have focused on the Early Ceramic record, recent geoarchaeological investigations at Magic Mountain revealed potential for stratified Early Archaic and Paleoindian cultural deposits at the site. A buried landscape marked by a prominent paleosol developed in alluvium occurs beneath a 1.8 m thick mantle of colluvium. Radiocarbon ages determined on soil organic matter (SOM) indicate that the paleosol was buried soon after ca. 9000 BP, and temporally undiagnostic artifacts occur on and within the paleosol. This paper describes the stratigraphy, geochronology, depositional environments, and paleopedology of the site, and the results of $\delta^{13}\text{C}$ analysis of SOM are used to infer bioclimatic change for the period of record.

Mandel, Rolfe (Kansas Geological Survey)

[219]

Discussant

Mandel, Rolfe [8] see Niquette, Richard

Mangado, Xavier [30] see Sánchez de la Torre, Marta

Mann, Abby**[160]**

Humanizing the Past through Human-Canine Interactions in the Maine/Maritime Region: An Archaeological Case Study from the Holmes Point West Site in Machiasport, Maine

Archaeologists are challenged with humanizing their research, a task complicated by the sometimes-arcanic nature of our work. Indigenous communities and local stakeholders are often excluded, a result of long-standing exclusionary practices in academic research and colonization of archaeology by western institutions. Examining the past through the lens of communities offers a bridge between empirical and community-oriented archaeologies. Burial contexts are rich in evidence about the past and provide insight into cultural practices, dietary trends, individual and community choices, and interspecies interactions. This study explores human-canine interactions in the Maine/Maritime region through analyses of $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ isotopic ratios for past dietary information. Evidence from two individually interred dogs at Holmes Point West in Machiasport, Maine, are used as an analogy for human diet, following the Canine Surrogacy Approach (CSA). Stable isotope analysis complements traditional lines of evidence, including faunal, ethnographic, and spatial. Excavation and analyses of materials was completed in partnership with the Passamaquoddy Tribe, Maine Coast Heritage Trust, and the landowner. Ultimately, this project seeks to develop educational products for explicit use by community stakeholders invested in cultural heritage of the site, accomplished by combining empirical and community-oriented archaeologies to provide more holistic interpretations of the past.

Manning, Sturt [12] see Birch, Jennifer

Manunza, Maria Rosaria [196] see Day, Peter

Manzanilla, Linda (U Nacional Autónoma de México)**[10]**

The Palace of Xalla at Teotihuacan: An Overview of a Multifunctional Palace

The palace of Xalla is located between the pyramids of the Sun and the Moon. It is a 55,000 m² palatial complex with plazas, structures, rooms, porticoes, and patios surrounded by a double wall for patrol walk. It has been excavated extensively by Linda R. Manzanilla and her team from 2000 to 2019–2020, particularly in the central portion of the palace. Different functional sectors have been identified: (1) An important ritual sector in the center of the palace, with four equivalent structures surrounding a temple. Each of these structures is dedicated to a different deity: the Thunder God, the Fire God, the Mountain God, and the Goddess of Flowing Waters; (2) To the south, there is a huge plaza devoted to craft-production, and in the northeast, to the military guard of the palace; (3) An important domestic sector was identified from 2012 to 2019 between the ritual sector and the craft-production sector; (4) To the northwest, there is an important ritual tumulus that displays a wide variety of faunal remains, as well as many sumptuary goods. It also displays the treasuring of mica plaques. I will emphasize the possibility that this palace housed two of the co-rulers of Teotihuacan.

[10]

Chair

Manzanilla, Linda [10] see Beramendi-Orosco, Laura

Manzano, Bruce, David Pollack and A. Gwynn Henderson**[129]**

Fort Ancient Village Wild Turkey (Meleagris gallopavo) Management

Birds, and in particular turkeys (*Meleagris gallopavo*), were an important component of the Fort Ancient diet, often accounting for about 4% of the meat consumed by village residents. Our research focuses primarily on the humerus, as it is an element that is easily identified, sexual dimorphic by size, and rarely modified like other wild turkey leg and wing elements. Our analysis of turkey humeri recovered from two large Fort Ancient villages in the middle Ohio Valley documented two different turkey exploitation patterns. One, which we refer to as the Buffalo Pattern (46Pu31; $n = 277$ humeri) involved taking relatively equal numbers of males and females. The other, which we refer to as the Fox Farm Pattern (15Ms1; $n = 264$ humeri), involved taking more than twice as many males as females. Previously, we have argued that taking more males (Fox Farm Pattern) reflects the management of the turkey flock in the vicinity of villages with long and continuous occupational histories. In this paper, we report on our analysis of turkey bones, and in particular the humeri, from several other Fort Ancient villages, characterizing their turkey exploitation patterns, and interpreting Fort Ancient bird subsistence strategies.

Manzano, Bruce [254] see Bonzani, Renee

Marceaux, Paul (University of Texas-San Antonio)**[113]**

Discussant

Marchant, Robert [74] see Joly, Delphine

Marciniak, Arkadiusz (Institute of Prehistory, University of Poznan)**[199]**

The Origin of Cattle and the Changing Forms of Cattle-Based Agriculture in the Neolithic of the Polish Lowlands

Cattle was the most important domesticated animal in the Neolithic of the Polish lowlands. Different proxies of unspecified heuristic potential such as settlement location, ethnographic analogies, species composition have been used until very recently to reconstruct the character of cattle husbandry in the Neolithic. The nature of this evidence, in addition to a lack of any in-depths reflection on the complexity of husbandry practices, made these reconstructions largely inadequate, simplistic and superficial. The paper aims at presenting the objectives and preliminary results of the ongoing project aimed at reconstruction of major facets of cattle husbandry practices as well as forms of exploitation and use of this animal by the Neolithic farmers from the Polish lowlands. The objectives of the paper are twofold. Firstly, it intends to scrutinize the place of origin of domestic cattle and the introduction of cattle-based agriculture in the Polish lowlands. Secondly, it aims at presenting the changing character of cattle husbandry, as an outcome of husbandry traits of different cattle breeds, throughout the studied period. The paper will also outline the adopted multi-proxy faunal and archeogenomic approach to achieve the advocated goals.

Marciniak, Arkadiusz [199] see Kuijt, Ian

Marcone, Giancarlo (University of Engineering and Technology [UTEC])

[32]

Discussant

Marcone, Giancarlo (University of Engineering and Technology [UTEC]), Camila Capriata and Nina Castillo (Proyecto Qhapaq -Ñan)

[224]

The Tale of Two Valleys: The Inka Restructuration of Territories in the Peruvian Central Coast as Viewed from the Lurin and Cañete Valleys

How do territories form and transform? The study of the occupation of the Peruvian central coast and the formation of social groups along with the understanding of Inka impacts could help us to answer this question. The present paper seeks to unveil local and regional strategies that can give us a hint about how identities, politics and social organizations transform intentionally or unintentionally in these contact years. This paper seeks to present a comparative reconstruction of the late period occupations and their transformation after the Inka arrival in the Lurin and Cañete valleys based in several recent projects in the area. The available data shows that the Inca presence brought a reformulation of territorial organizations at the regional and local (valley) level. Main regional "Ischma" elites saw, at the same time, in one side challenges from local populations in their hinterland (Lurin Valley), on the other fortify their ties and authority over local elites like the Guarcos (in the Cañete Valley). Sociopolitical interactions are multidimensional in a region, even inside a valley. We think it is only possible to understand the effects of Inca society on local populations by examining the phenomenon at larger scales than just a valley.

Marcone, Giancarlo [105] see Castillo, Nina

Marean, Curtis [55] see Coon, Sarah

Marean, Curtis [38] see Fahey, Brian

Marean, Curtis [38] see Martin, Miles

Marean, Curtis [5] see McGrath, James

Marek-Martinez, Ora [184] see Ekdahl, Amanda

Marengère, Véronique (Université Laval; Centre d'études nordiques), Kevin Smith (Haffenreffer Museum, Brown University) and James Woollett (Université Laval, Centre d'études nordiques)

[50]

What Does a Fire Giant Eat? A Zooarchaeological Analysis of Surtshellir's Burnt Faunal Remains

In the ninth and tenth centuries CE, a very distinctive and unique site was established inside the cave of Surtshellir. This lava tube was reputed to be the home of the mythological fire giant, Surtur and has been studied over the course of several years by a team led by the Haffenreffer Museum (Brown University), Þjóðminjasafn Íslands and Minjastofnun Íslands. Within this cave, various and unique artifacts have been found alongside massive piles of faunal remains and burnt bone fragments associated with a boat-shaped structure made of stone. This paper will report on ongoing analyses of burnt bone remains found inside Surtshellir during the 2013 campaign. Through experimental archaeology and analysis of taphonomic traces, the study seeks to determine how faunal remains were treated. Through correspondences between their spatial distribution and the artifacts found on site, we will also attempt to evaluate current hypotheses regarding the use of burnt animal bones. Are they remnants of ritual offerings and sacrifices made to Surtur, leftover meals or were they simply used as fuel?

Marengo, Nelda (University of California, Riverside) and Mónica Rodríguez (Bioarchaeology Lab, UADY)

[225]

Mortuary Bundles, Decapitations, and Head Cosmograms: A Postclassic Period Funerary Assemblage from Vista Alegre, Quintana Roo, Mexico

During the 2016 field season, the Costa Escondida Project (directed by Jeffrey Glover, Georgia State University; Dominique Rissolo, University of California, San Diego) participants and UADY personnel jointly excavated a Postclassic period primary burial from the site of Vista Alegre. All anatomic segments were registered on-site, following the methods of archaeoethnology, which are geared toward understanding integrally the complex mortuary sequence that produced this assemblage, including the form of its funerary

space and type of wrap, the taphonomic timing of a subsequent entry event, when two severed heads and two mandibles were deposited with the primary burial. Subsequently, the context was radiocarbon-dated and a 3D model developed using Structure from Motion software. Bioarchaeological scrutiny determined a primary burial of a wrapped and seated female. Both skulls, one belonging to a male individual, the other to a female, held their first vertebrae still articulated with the lowest one displaying chop marks. Delineating an embodied cosmogram, the male head had been placed facing up and the female one facing down. By comparing this case study from Vista Alegre with others from the Yucatán Peninsula and beyond, we argue that head placements of this kind were part of broader late Maya mortuary traditions.

Marengo, Nelda [189] see Romero, Ashuni

Margotta, James (Wheaton College Massachusetts) and Maxwell Forton (Binghamton University)
[122]

This Was Never Wilderness: An Archaeological Survey in Gila National Forest

For the past two field seasons the Upper Gila Preservation Archaeology (UGPA) field school, run jointly by Archaeology Southwest and the University of Arizona, has conducted archaeological surveys of Lincoln Canyon in Gila National Forest. These surveys have established the rich cultural history of this canyon, ranging from the Archaic to Historic time periods. While the collected data is typical of southwest New Mexico sites, such surveys have greater implications beyond the tangible record. Archaeological survey of Lincoln Canyon reveals that site data is useful for heritage management by the Forest Service and deconstructs false narratives of untouched virgin nature. This poster presents the results of the UGPA Lincoln Canyon survey and examines the canyon's place in heritage discourse, especially in the lens of archaeological ethics, institutions of cultural heritage, and discussions on the greater Southwest/Northwest.

Marin, Liliana [8] see Tew-Todd, Victoria

Marino, Marc (University of Arkansas) and Wesley Stoner (University of Arkansas)
[168]

Things We Know Because of Ron: Bishop's Impact on the Field of Archaeological Materials Science

Ron Bishop is nothing short of a pioneer in archaeological science. Today, hundreds of archaeologists working around the world owe much of what they do to Ron's methodological and empirical contributions in the realm of materials science. He has personally co-authored research with over 100 other researchers. Through this presentation we revisit some of Ron's greatest contributions, and demonstrate how our own research and teaching (and that of others) has benefited from the advances he continues to make every year. We divide this talk into three parts: the history of Ron's emergence into archaeological materials science, his methodological contributions to the archaeological study of ceramics, and his impact on Mesoamerican archaeology.

Marion, Sandra [97] see Higgins, Howard

Mark, Robert (Ruperstrian CyberServices)
[95]
Discussant

Marken, Damien (Bloomsburg University), Matthew Ricker (North Carolina State University) and Robert Austin (North Carolina State University)
[130]

Filled to the Brim: Estimating Lowland Maya Reservoir Capacities by Combining Survey, Soil Cores, and GIS

One of the limiting factors to settlement aggregation in the Maya lowlands is the availability of potable water. With few perennial surface rivers and lakes, the ancient Maya collected water from rainfall for consumption. In areas with high population densities, such as Classic period cities, this required engineering the built landscape to funnel water for collection and storage to various types of basins and formal reservoirs. This paper presents the results of a multi-year project collecting and analyzing surface and subsurface topographic data to improve methods for estimating the capacities of these water catchment features at the Classic Maya city of El Perú-Waka', Petén, Guatemala. Typically, reservoir capacity estimates in the Maya area rely upon mapped surface topography to estimate storage volumes and occasionally employ subsurface excavations to increase depth measurements. The present study integrates data from terrestrial and lidar mapping with soil core transects to model the subsurface topography of a sample of reservoirs with GIS tools to more accurately estimate holding capacities at or near their time of use.

Marken, Damien (Bloomsburg University)
[155]
Discussant

Markin, Julie [184] see Chisholm, Amelia

Marks, Theodore [18] see Hollingshead, Analise

Marks, Theodore [222] see Ostahowski, Brian

Marquardt, William (University of New Mexico, United States Forest Service)
[192]

Ephemeral Archaeologies: Reconstructing a Single Occupation CCC Camp in Garfield County, Washington

Archaeological interpretations of temporary workers' camps from the late-nineteenth to mid-twentieth centuries are greatly aided by historical documents, oral accounts, and photographic evidence. This paper combines surface archaeological data with documentary evidence to reconstruct a large Civilian Conservation Corps (CCC) work camp that was occupied for a single summer in 1933 on Mt. Misery, Garfield County, Washington. While the CCC indelibly changed how public lands are used in the United States through the construction of thousands of administrative buildings, campgrounds, roads, and trails in National Parks and National Forests across the country, their camps were intended to be temporary and were frequently demolished after abandonment, impacting future archaeologists' ability to conduct research on these sites. Despite the brief occupation history of the Mt. Misery Camp and the demolition of most of the surface structures on the site, fieldwork conducted by the Umatilla National Forest and the Youth Conservation Corps in the summer of 2019 uncovered a wealth of archaeological data that provides valuable insight into how CCC camps were organized and the lives of the people who built the modern National Forest system.

Marquardt, William [59] see Lulewicz, Isabelle

Marques, Aguinaldo [161] see Kipnis, Renato

Márquez Ramírez, Danitza (University of Bonn)
[259]

Land Ownership in Colonial Peru: Interrelated Dependencies as Seen through the Archival Records

In pre-colonial Peru, the management of resources was exercised by local chiefs to ensure their redistribution and facilitate wellness for their communities. Therefore, concepts such as "ownership" or "property" related to land tenure introduced by the European colonizers in the sixteenth century caused major upheaval for the Andean societies, since their "land rights" were only valid after Spanish legal acknowledgment that allowed individuals to exercise "ownership" and the access to agricultural and livestock regional markets and thus, economic wellness, which consequently made them dependent on the lands they could usufruct. Nevertheless, this dependency became "strongly asymmetrical" when the Spanish authorities favored the interests of indigenous elites while undermining those of the Indian commoners, whose condition within the Colonial system was defined in terms of tributary labor coercion, similar to the slavery system. Through the hermeneutic analysis of archival records (e.g., wills, lawsuits, land compositions, visitations) this paper aims to analyze long-lasting conflicts regarding land tenure and proposes a comprehensive approach from the perspective of asymmetrical and interrelated dependencies on natural resources, the spatiality of lands, and Spanish legal recognition. The case study is developed after written documents related to the province of Cajamarca in northern Peru (sixteenth–eighteenth centuries).

Marreiros, João [162] see Chu, Wei

Marsh, Erik [243] see Carline, Kristin

Marshall, Lydia Wilson (DePauw University)
[97]

Toward a More Collaborative Archaeology in Eastern Africa

Archaeology developed in Eastern Africa under a colonialist framework. Geopolitical power imbalances continue to affect archaeological practice there today. For example, because of their easier access to funding, European and American archaeologists have disproportionate power in setting the research agenda in the region. This paper considers two alternate strategies for seeking a more collaborative approach to archaeology in Eastern Africa. The first, which I practiced in the study of nineteenth-century fugitive slave communities in Kenya, focuses on the collection of oral histories and community input in site interpretation. The second, taken up more recently in the study of slaving in southern Tanzania, locates collaboration earlier in the research process. In this model, collaboration begins at project design and includes Tanzanian archaeologists as full research partners. This paper argues that a truly collaborative approach is only possible when Eastern African archaeologists' expertise and research interests undergird project design.

Martal, Clementine and William Pratt (University of Texas, Austin)
[201]

Live in the Layers: Complex Earthen Architecture at Cochasquí

Investigations began at Cochasquí in 2017 to examine the construction techniques used to build Pyramid G, the largest pyramid at the site. Previous excavations along with the more recent work on Pyramid G suggest that the pyramids were constructed over several phases representing sequential occupations. Though commonly thought of as simply piles of dirt taken from the surrounding landscape, the pyramids at Cochasquí demonstrate a remarkable level of internal organization with very particular sediments chosen and used in particular ways. Alternate layering of sediments is seen in large portions of fill with loamy or more clay-rich sediments interspersed by gravelly pumice. The tendency for these layers to correspond well to other architectural features such as

cangahua walls suggests that they are intentional architectural features rather than accidental artifacts of construction. Earthen floors composed of a combination of sediment types, interspersed between zones of organized fill, appear to have been mixed and potentially processed in a variety of ways. The careful analysis of sediments indicates that large portions of the pyramid were meticulously constructed with individual basket loads of different sediments intentionally placed in their proper place suggesting that these massive structures may be much more complex than previously realized.

Martí Gil, Irene

[186]

Fighting the Antiquities Black Market: Analysis of the Twenty-First-Century Illegal Trade in Antiquities and the Legal Framework to Deter It

This poster presents an approximation to the PhD dissertation currently being developed and the results obtained by April 2020. The research project examines the suitability of the international legal framework for the protection of cultural heritage against antiquities trafficking. The illegal trade in antiquities, as any criminal activity, is subjected to a constant process of transformation to escape detection and punishment. In recent decades, it has adapted to the increasing shift toward e-commerce and online networking to expand, democratize, and sophisticate their strategies and niche market, for which the enforcement of the available cultural heritage laws are proven to have fallen short. Hence, the goal is to define the transformations that the traffic of antiquities has experienced with the rise of Internet by conducting literature research and web-based fieldwork to generate first-hand data on the twenty-first century antiquities market, and evaluate whether the legal shield is appropriate to accomplish its goals. For the latter purpose, discourse analysis, critical discourse analysis, comparative analysis, and conceptual analysis will be undertaken on domestic and international legal corpora, official documents and a variety of significant legal case-studies, to both identify the existent legal shortcomings and reformulate the heritage policies accordingly.

Martin, Debra (University of Nevada/Las Vegas)

[131]

Discussant

Martin, Debra (University of Nevada/Las Vegas) and Ryan Harrod (University of Alaska, Anchorage)

[210]

Inequality at Chaco Canyon (AD 900–1150): Creating Subordinates through Coercion and Fear

There has been debate about the degree of complexity and hierarchy present in the pre-contact Southwest cultural region. Recent analyses have revealed evidence that Ancestral Pueblo communities in the San Juan Basin established and maintained a politically complex society with at least some inequality, especially at major sites in Chaco Canyon located in north-central New Mexico. Site layout, mortuary context, isotopic analysis, reconstructions of biological identity, health, trauma data, and genetic relationships all support the idea that some members of the Ancestral Pueblo groups were higher in status than others. We argue that the development of inequality was achieved through social control and coercion, and that various forms of indirect and direct violence were entwined with political strategies used to regulate and extract labor from large numbers of people. Additionally, ethnohistoric and archival data from Pueblo informants and their Athabascan neighbors suggest that the development of high status leaders was not a gradual process but something that both began and ended rapidly. This is in line with the archaeological and biological data analyzed at Chaco sites. By manipulating ideological beliefs and controlling key rituals, some gained authority and power over subordinate subjects who were denied access to resources.

Martin, Debra [131] see Ralston, Clair

Martin, Erik (Far Western) and Chelsea Karthaus (Far Western)

[5]

Variation in Occupational Intensity and Mobility at Upland Springs in Arid Northwestern Nevada.

Far Western recently completed test excavations and data recovery at several upland springs in northwestern Nevada, documenting hearth features, flaked and ground stone tools, faunal remains, and thousands of pieces of debitage. Here we examine both from where and when the spring sites were occupied. XRF toolstone sourcing analysis data is compared to other regional datasets to examine trends in toolstone acquisition and implied regional mobility. Next, series of historical satellite imagery measuring vegetation abundance is analyzed as a proxy for spring drought resilience. Using obsidian hydration frequencies at sites to reconstruct occupational intensity, we compare trends in site occupation, spring drought resiliency, and regional population dynamics.

Martin, Fabiana (CEHA-UMAG)

[270]

The Cueva del Milodon Collections Stored at the Natural History Museum, London, United Kingdom

Among the many Late Pleistocene faunal collections from Southern Patagonia, those obtained at Cueva del Milodon, southern Chile are particularly important. The main reason is the excellent preservation of Late Pleistocene faunal remains, including soft tissues, but also their significance in terms of several processes like the extinction of Late Pleistocene faunas, the subsistence of the first inhabitants of Southern Patagonia and the paleoecological conditions under which those processes were taking place. Some of those collections were obtained at the turn of the twentieth century, and sold in Europe. In spite of the absence of information about the recovery process, those faunal collections are extremely useful. We present a study of the collections stored at the Natural History Museum, London, and indicate in which ways those remains impact current excavations and studies going on at Cueva del Milodon.

Martin, Fabiana [119] see Morello Repetto, Flavia

Martin, Jennifer

[175]

Artifact Illustration Using Camera Lucida Technology: A Guide for Researchers

Artifact illustration is an expensive and time-consuming process. As a result, only a select few artifacts will be illustrated from a large collection. While Photography and 3D Modeling have made great advances in disseminating information, they do not always convey the information a researcher wishes the audience to see. For this paper, I examine the use of a seventeenth-century technology which has been brought into the twenty-first century by means of a smartphone application. I provide a simplified guideline for using this technology. The use of the camera lucida has proven to increase speed and accuracy in producing artifact illustrations with the goal of lowering cost so researchers may share more information with the scientific community.

Martin, Juan Guillermo [196] see Iñáñez, Javier

Martin, Lois (Fordham University)

[2]

Symmetries of Corn and Cloth in the Ancient Americas: Pattern Generation, Botany, and the Maize Matrix

Several precolumbian royal garments with simple, repeating geometric designs have explicit associations to maize, and hint at a deep significance to the cloth pattern—corn plant connection. In the Andes, Inca Coyas (noble women) wore special woven belts during the annual Corn-planting ceremony. Sophie Desrosiers deciphered Murúa's colonial-era code for the belt pattern in the 1970s, replicated the design, and located a few museum specimens. In 2002, Lynn Meisch encountered weavers in highland Ecuador still producing almost identical "Sara" belts, named after the "Mama Sara," an oversized corncob. In Mesoamerica, likewise, the Aztec tlatoani (king) wore a blue-green mantle with a dotted diamond grid design (xiuhtlapilli tilmatl); it belonged to a maize-inspired panoply of regalia worn and wielded by Mesoamerican sovereigns for millennia, including sprout-shaped crowns, leaf-like quetzal plumes, dewdrop-like jade beads, and cob-like greenstone celts. Aztec maize goddesses and their impersonators wore similarly decorated fabrics, but in white or reddish tones. Maize was fundamental to precolumbian societies, so regents sought to associate themselves with its promise through dress. This investigation addresses the multiple visual, dynamic, and metaphorical correspondences that link these textile patterns to maize, especially to the mutated and twinned cobs symbolic of extraordinary potency.

[2]

Chair

Martin, Miles, John Murray (Arizona State University), Jacob Harris (Arizona State University) and Curtis Marean (Arizona State University)

[38]

Heat Treatment of Silcrete during MIS 5 to 4 Transition at Pinnacle Point, South Africa

The heat treatment of stone tools marks a key technological advancement in early human cognition. Some of the earliest evidence for this is in the archaeological record at the Middle Stone Age (MSA) site Pinnacle Point 13B in South Africa around 164,000 years ago (ka). By approximately 70 ka, heat-treated silcrete is found throughout South Africa. This increase in silcrete use corresponds to the MIS 5 to MIS 4 transition and the eruption of the Toba super-volcano. In this research, we investigate the role of heat treatment in the production of stone tool technologies across the MIS 5–4 transition. We accomplish this using a new method to identify heat treatment that combines surface roughness, 3D microscopy, and Bayesian modeling. Our analysis consists of 143 silcrete artifacts from sub-aggregates that correspond to this transition at the MSA site of Pinnacle Point 5–6. Our results have implications for MSA hunter-gatherer technological strategies during a glacial transition.

Martin, Miles [38] see Carroll, Peyton

Martin, Richard [188] see Lowe, Kelsey

Martin, Samuel, Dominique Langis-Barsetti (University of Toronto), Joseph Lehner (University of Sydney), Emre Kuruçayirli (Bogaziçi University) and Nicolle Hirschfeld (Trinity University)

[175]

Investigating Copper Ingot Production in the Bronze Age Mediterranean Using 3D Derived Measurements

Over one ton of completed and fragmentary copper ingots comprised the primary cargo of a ship that sank at Cape Gelidonya in southwestern Turkey, ca. 1200 BCE. Pb-isotope and metallographic analyses indicated that the metal originated in Cyprus and was made through diverse methods of production. A new analysis began in 2016 using photogrammetry and structured light scanning to model 268 complete copper ingots and fragments in 3D. The weight of oxide and bun ingots combined with surface area and volume measurements obtained from accurate, sub-millimeter 3D scans are being used to test the degree of standardization of ingot production methods. Using weight and 3D metrics we may be able to extrapolate the porosity of ingots, which may have had an impact on breakage patterns. The ability to predict breakage would have been useful to ancient metal-workers and distributors. Additionally, morphometric data was used to identify technological and material similarities among complete ingots in order to establish typologies. Using 3D models to extract the dimensions, they can serve as a basis for classifying fragmentary pieces. When combined with the isotopic and elemental data we hope this refined typology will help us better understand the significant variation among ingot types.

Martin, Simon (University of Pennsylvania Museum)**[128]***Order from Chaos: Maya Kingship Reimagined in the Classic Era*

Mayanists have, with good reason, dealt at length with the ninth-century collapse of Classic society but have increasingly recognized that a previous calamity, marking the end of Preclassic society around the second century, almost as traumatic. Great settlements were abandoned and the population suffered a serious decline, all associated with the disappearance of forms of political authority that had developed over the previous millennium or more. While vestiges of the old system were retained, a radically new set of ideas took precedence, with a new emphasis on central power and a dynastic bloodline. This paper explores the commonalities and differences between new and old in search of the factors and mechanisms that brought political order from chaos.

Martin, Simon (University of Pennsylvania Museum)**[223]***Discussant*

Martin, Simon [223] see Beliaev, Dmitri

Martin, Terrance [233] see Painter, Autumn

Martin, Worthy [98] see Heitman, Carrie

Martin-Apostolatos, G. [159] see Trusler, Kate

Martindale Johnson, Lucas (Far Western Anthropological Research Group Inc.)**[203]***X-ray Florescence (ED-XRF) Analysis of Obsidian Artifacts from Caracol, Belize*

This paper will discuss the results of handheld XRF analysis carried out at the Classic Period Maya city of Caracol, Belize. XRF analysis of technologically, spatially, and temporally controlled samples can inform the nature of regional exchange within a politically active region. Additionally, geochemical and spatial relationships of artifacts within cities can provide crucial data surrounding the nature of intra-city economies (e.g., markets, non-markets). Caracol's geographical location, straddling the border of the Petén region to the west, and the areas of northern Belize and the Belize valley to the east was, we argue, an important economic center in the region, and has only recently been considered in regional obsidian studies. We present XRF analysis of 2,038 obsidian artifacts from Caracol, Belize and discuss the results in terms of regional exchange and the intrasite distribution through time. We also discuss data considerations of analyzing thinner blade artifacts with XRF and the processes of making source assignments to small and/or thin artifacts in an effort to contribute to the refinement of the XRF methodology.

Martindale Johnson, Lucas [5] see Davis, Mary

Martinez, Desireé [184] see Lippert, Dorothy

Martinez, Kailey (New Mexico State University)**[270]***Balance on South Diamond: Using Faunal Analysis to Understand Biodiversity and Resource Use Trends in the Northern Mimbres Region*

The Gila National Forest/Wilderness consists of rich mountainous land spanning between western New Mexico and eastern Arizona. This land was once home to the people of the Mimbres culture. The environments within these natural areas vary due to different altitudes and precipitation, which also affect the variety and amount of ecological resources. Two sites that have been excavated in the Northern Mimbres region by New Mexico State University students, professors, and volunteers include South Diamond Creek Pueblo (SDCP) and Twin Pines Village (TPV). Both settlement size and resource availability would have worked to dictate what resources were being exploited on each site. Beyond just these two sites, the differences of resource availability within the Northern Mimbres region and other Mimbres occupied areas outside of it may also be apparent within the archaeological record. The goal of the study is to determine if diversity trends and species abundances from the faunal assemblages of SDCP and TPV are similar to or different from other Mimbres sites of the same time range and to determine if it is possible to accurately estimate what transitional phase of the adaptive cycle these sites were in during the Classic Mimbres Phase.

Martinez, Marcos (Arizona State University), Alexandra Greenwald (University of Utah), Deborah Blom (University of Vermont) and Kelly Knudson (Arizona State University)**[61]***Isotopic Biographies of the Andes: $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ Measures in Sequential Samples of Permanent First and Third Molars in Moquegua Valley and the Lake Titicaca Basin*

Human behavioral ecology predicts that individuals will modify subsistence strategies to maximize agro-pastoralist production rates and mitigate agricultural losses in response to environmental uncertainty and socio-cultural circumstances. We utilize stable isotope measures ($\delta^{15}\text{N}$ and $\delta^{13}\text{C}$) of early childhood diet into adulthood from over 185 dentinal collagen sequential samples by combining

permanent first and third molar datasets from 10 individuals as proxies for the interplay of mixed agricultural-pastoralist subsistence strategies utilized by the interred individuals at the site of Chen Chen, in the Moquegua Valley, Peru, and the Akapana and Markapata sectors of the site of Tiwanaku in the Lake Titicaca Basin of western Bolivia. During the Middle Horizon (ca. AD 500–1000), the environmentally vulnerable practice of irrigated floodplain agriculture is linked to the Tiwanaku Chen Chen phase colonies of the Moquegua Valley region, while Tiwanaku's groundwater-fed, raised-field systems were more drought resistant. The fine-scaled (12–24 month intervals) datasets generated by sequential sampling of dentinal collagen allow us to examine the relative inclusion of isotopically distinct cultigens and elucidate dietary differences brought about by differing agro-pastoralist practices between the residents of the Tiwanaku heartland and its western lowland colony at Chen Chen.

Martinez, Valentina and Andres Garzon-Oechsle (Department of GeoSciences, Florida Atlantic Univer)

[257]

Landscapes, Architecture, and Settlement Patterns: Reflections on the Territorial Expansion of the Manteños and the Establishing of a Distinct Social Identity

Considering Smith's (2007) comparative approach to ancient urban planning, this paper suggests that starting circa 1200 CE the Manteño engaged in a process of increased growth and expansion that led to a shared, standardized settlement strategy across an environmentally diverse area. This shared settlement strategy reflects a complex process of continuous coherence of Manteño communities into a larger social unit. This is evident in the large-scale terrain modifications and thousands of stone foundations found across the diverse landscapes of Manabí. Our work in the cloud forests of El Pital shows that the Manteño extensively modified marginal settlement areas such as the rugged slopes and deep cut valleys of the Paján Mountains to accommodate a growing population. We explore this shared settlement strategy by analyzing commonalities and differences in viewshed, access, and architecture between El Pital and other key Manteño settlements in different environments and elevations. The political and social implications of this study are addressed as well, contributing to the expanding literature of complex societies and settlement patterns in the New World's neo-tropical regions.

[257]

Chair

Martinez, Valentina [257] see Ayers-Rigsby, Sara

Martínez Carrillo, Miguel [101] see de la Rosa, Yuri

Martínez de Luna, Lucha (Independent Scholar) and Juan Ignacio Macias Quintero

[267]

O'na Tök: A Preclassic Zoque Center in Chiapas, Mexico

Preliminary explorations at the previously unknown Zoque site of O'na Tök reveals within a mid-montane wet forest, a multifaceted archaeological landscape containing an early ceremonial center, an expansive area of long architectural platforms, and nearby caves used for ritual purposes. Analysis of obsidian and pottery recovered on the surface of the site show the Zoque of O'na Tök occupied the center during the Early Preclassic until the Postclassic period. The architectural layout of the site does not correspond with similar patterns often associated with other contemporary sites, suggesting the center may have played a distinct role in the region. Test pits in the ceremonial center have revealed two distinct stratigraphic layers of occupation dating from the Early Preclassic and Middle Preclassic. The excavations also uncovered a Preclassic midden containing high-quality cooking and serving vessels, food refuse, lithics, figurines, obsidian from several sources, and luxury trade goods. Cultural material from the ceremonial center suggest interactions between the Gulf Coast and centers in the Central Depression of Chiapas. These data indicate that the occupants participated in active interregional interaction, with the site of O'na Tok functioning as a primary center along a previously unknown exchange corridor in Chiapas.

Martínez López, Cira [39] see Minc, Leah

Martinez Milantchi, Maria Mercedes (British Museum), Alice Samson (Leicester University), Jago Cooper (British Museum), Michael Charlton (University College London) and Carlos Perez (Instituto de Cultura Puertorriqueña)

[239]

A Materials Science Consideration of New World Encounters: Multi-method Approaches to the Archaeology of the Caribbean

Following a recent review of excavated materials from the island of Mona (Puerto Rico), this paper examines the transformation of cultural and technological practices brought about by New World encounters. We focus on the affective material conditions that emerge in the sixteenth-century Caribbean by applying a materials science approach to the newly integrated materials in archaeological contexts. This sheds light on the interaction between the newly arrived European and local Taíno populations. From the re-cycling of iron ship nails in local structures to the refashioning of glazed ceramics into indigenous spindle whorls, this study reconsiders the agency that local Indigenous populations exercised by integrating aspects of European material cultures into traditional and transforming lifeways. Importantly, this paper raises questions about the brokering between experience and resistance in these complex spaces of interaction and exchange.

Martínez Mora, Estela and Guillermo Córdova Tello (DEA-INAH)

[144]

Apuntes para interpretación del Grupo 7 de Tamtoc, San Luis Potosí

Como su nombre lo indica, el eje de investigación en el proyecto "Origen y desarrollo del paisaje urbano de Tamtoc, SLP" es el

estudio de la evolución del fenómeno urbano. A partir del estudio estratigráfico y de la aplicación de modelos para el estudio de la disposición espacial de conjuntos arquitectónicos, hemos realizado excavaciones en tres estructuras del Grupo F, cuyos resultados aplicaremos en una propuesta de secuencia temporal y entorno espacial preliminar del Grupo F y particularmente de la Estructura F7. En la documentación de estos contextos, presentaremos los fechamientos por 14C.

Martínez Mora, Estela [144] see Córdoba Tello, Guillermo
Martínez Mora, Estela [144] see Valentín Maldonado, Norma

Martínez Vázquez, Dante Bernardo (INAH-Michoacán), José Luis Punzo Díaz (INAH), Alfonso Ramírez Galicia (ENAH), Roberto Díaz Sibaja (UMSNH) and Juan Julio Morales (UNAM)
[198]

Cueva de los Hacheros: A Late Pleistocene Site (12,000 yrs BP) in Western Mexico

The Cueva de los Hacheros is an archaeological site located in the state of Michoacán, in western Mexico. The site is a rockshelter that was investigated during the years 2016 and 2017, where excavations and surface prospection were completed. During the excavation, the deeper levels of the shelter could be identified, in which abundant lithic material and bone remain (especially animal bones) were found. The radiocarbon dates run on carbon from the deepest levels of the shelter yielded a result 12,000 yrs BP showing the oldest evidence of human activity in the state of Michoacán. Among the recovered materials associated with this date, there are lithic artifacts, including spear points, knives, scrapers, cores, and flakes, most of which are made of basalt, rhyolite, and chalcedony. It also highlights the presence of several fossils of animal and human origin. Fossils of extinct Pleistocene fauna could be recognized. The Cueva de los Hacheros site has become an important place of investigation to understand human activity during the late Pleistocene period in western Mexico and pacific coast.

Martínez-Tagüña, Natalia [15] see Pailles, Matthew

Martini, Sarah (Yale University) and Stefan Dreibrödt (Kiel University, Institute for Ecosystem Research)
[85]

On-site Geoarchaeology as a Method of Archaeological Hypothesis Testing on Multilayered Settlement Mounds: Examples from a Transect of Sites from Anatolia to Central Europe

In almost all cases, the majority of an archaeological site is composed of sediment. For many decades, this "matrix" from which material was recovered and in which structures were uncovered was ignored and displaced before being used to backfill trenches. If this matrix is not simply disregarded, the preservation of layers of sediment formed during the accumulation of architecture and debris resulting from continuous, overlapping inhabitations in tells and multilayered settlement mounds provides an invaluable record of interactions between cultural and natural processes. Furthermore, the wide spread of this "type" of site across Eurasia and their often extended duration of occupation offer the chance to compare and contrast these records both spatially and diachronically. The analysis of the geochemical and geophysical properties of these sediments can thus be used to complement archaeological investigations and test hypotheses made on the basis of other archaeological data. In this paper sediment records from eight tell or multilayered sites occupied for varying intervals from the Neolithic through the Roman Iron Age and stretching from Anatolia to central Germany are examined in order to establish the possibilities afforded by and weakness inherent in the application of qualitative and quantitative geoarchaeological analyses for this hypothesis-testing purpose.

Martino, Shannon (Morton College)
[205]

Evidence of Local Resource Procurement for Early Ceramics in the Ilgin Region of Turkey

This paper will present the preliminary results of Neolithic to Early Bronze Age ceramic analysis from the Yalbur Yaylası Archaeological Landscape Research Project. While the Neolithic evidence is minimal, the evidence for an expansive Middle Chalcolithic presence in the area is growing. The material analysis will be discussed in the context of regional hydrology and geological sources as well as relative chronology in order to illuminate settlement patterns and resource use outside of nearby and well-recognized prehistoric centers, such as Çatalhöyük. Preliminary analyses indicate that local resource use can be identified in the ceramic fabric, particularly during periods when mineral tempers were used, and one need not focus only on a narrative of interregional networks when doing survey. Identifying the use of local clays and inclusions also highlights the importance of further scientific analysis for identifying local resource procurement and landscape interaction.

Martinón-Torres, Marcos (University of Cambridge), Xiuzhen Li (UCL Institute of Archaeology), Yin Xia (Emperor Qin Shihuang's Mausoleum Site Museum, Xi'a), Agnese Benzonelli (UCL Institute of Archaeology) and Andrew Bevan (UCL Institute of Archaeology)
[42]

"Anti-rust" Surface Chromium on the Qin Terracotta Army Bronze Weapons: New Research and Implications

For forty years, there has been a widely held belief that over 2,000 years ago the Chinese Qin developed an advanced technology using chromium to prevent bronze corrosion. This belief was based on the detection of chromium traces on the surface of bronze weapons buried with the Terracotta Army, and the same weapons' very good preservation. The purported 'anti-rust' treatment seemed coherent with the Qin concern with the afterlife. In order to revisit this suggestive hypothesis, we analysed weapons, lacquer and soils from the site, conducted chromium-treatment replications and accelerated ageing experiments. Our results demonstrate that the chromium on the bronzes is not the result of a deliberate treatment but simply postdepositional contamination from nearby chromium-rich lacquer. Further, we argue that the explanation for the bronze preservation is partly related to the composition of the surrounding soil. Our work solves a long-standing controversy but opens new questions for research on

archaeological bronzes and lacquer in the Qin state and beyond.

Martinón-Torres, Marcos [42] see Li, Xiuzhen
 Martinón-Torres, Marcos [42] see Liu, Yaxiong

Marwick, Ben (University of Washington) and Pham Thanh Son (University of Ferrara)

[17]

An Update on the Sonvian-Hoabinhian Controversy: Shape Analysis of Flakes and Cores from Mau A, Northern Vietnam
 Understanding stone artifact variation in northern Vietnam can be challenging because of the underspecified cultural taxonomies that have dominated analytical frameworks. For example, the Hoabinhian is often thought to be a descendant taxa to the Sonvian. Our recent excavations at Mau A challenge this sequence. We apply statistical shape analysis methods to overcome previous limitations relating to subjective and irreproducible stone artifact classification methods. We clarify the definitions of Sonvian and Hoabinhian technologies, present new radiocarbon ages, and provide a new framework for explaining the variability of these technologies.

Marwick, Ben (University of Washington)

[87]

Discussant

Marwick, Ben (University of Washington)

[139]

Moderator

Marwick, Ben [55] see Park, Gayoung

Marx, Deborah [18] see Delgado, James

Mas-Florit, Catalina [35] see Smith, Alexander

Massey, David [175] see Friberg, Christina

Massey, Sarah

[21]

Tajahuana: New Perspectives on a Paracas Site in the Middle Ica Valley

This paper presents the results of the 2019 season of excavations at the site of Tajahuana in the middle Ica Valley. Widely considered to be an important Ocucaje Phase 9 center, this assessment is based primarily on surface observations of the site's summit. To understand better the nature of summit occupation, excavations were conducted on examples of public architecture, specifically a group of low mound-like structures and a series of earthen walls bordering the summit's edges. Excavations define the form, materials and construction techniques of these structures as well as associated artifacts. Analysis of pottery collected during excavations and from surface collections as well as radiocarbon dating establish the chronological parameters of the summit occupation. The measurement, location and construction of Tajahuana's walls not only provide insight into their function but also into the spatial organization of the site and the dynamic relationship between the summit and occupation areas situated along the lower slopes. The mobilization of resources and labor required to build the walls and other summit structures have implications for a larger regional context.

Masson, Marilyn (University at Albany SUNY), Carlos Peraza Lope (Centro INAH, Yucatán), Bradley Russell (University at Albany SUNY) and Timothy Hare (Morehead State University)

[138]

Constructing Biographies of Place through Mortuary Practice and House Style in the Early Colonial Maya Period at Yacman and Hunacti, Yucatán

Placemaking represented an important activity for Maya residents of the early Colonial visita sites of Yacman and Hunacti, Yucatán. As rural settlements distant from centers of Franciscan power and Colonial Maya authorities, these localities provided particular opportunities to reconstitute social life in a rapidly changing regional setting. Each settlement was associated with evidence for continued practice of traditional Maya religion. At the same time, both embraced a reverential construction and use of built environmental features of European derivation in the context of reconstitution of social identity. Yacman's residents adopted the chapel's interior space for traditional mortuary practices, specifically, a family mausoleum for placement of non-Christian style graves, and purposeful disturbance and arrangements of the bones of previously interred persons. Hunacti's Maya nobles accessed a considerable labor force, and despite the town's relatively marginal importance, they constructed elaborate, European style dwellings for their families, as well as an impressive chapel and atrium. The founding and construction of Hunacti reflect ambitious designs, probably facilitated by close familial ties of its leaders to the resourceful regional Maya lord at Mani.

Masson, Marilyn [20] see Glumac, Bosiljka
 Masson, Marilyn [269] see Hare, Timothy

Masucci, Maria (Drew University)**[257]***Discussant***Masur, Lindi (University of Toronto)****[235]***Maize Agriculture, Landscape Construction, and Identity in Southwestern Ontario, AD 1300*

This paper examines the practice of maize agriculture in southern Ontario ca. AD 1300, particularly among Western Basin Tradition (WBT) communities. Archaeological narratives have illustrated the enigmatic WBT as culturally distinct from neighbouring Iroquoians in terms of settlement and subsistence, characterized as mobile hunter-gatherers engaging minimally, if at all with agricultural endeavours. Paleoethnobotanical analyses of sites along the borderlands of Iroquoian influence have revealed the ubiquitous cultivation of maize, as well as a unique suite of plant species suggesting these communities were engaging in significant landscape management practices and perhaps even had a distinct gastronomic tradition. This paper will examine our current understanding of the adoption of maize agriculture among WBT groups, and elucidate the construction and reification of social identities through human-plant interactions and subsistence practices among localized communities.

[235]*Chair*

Mathé, Vivien [107] see Ard, Vincent

Mathews, Jennifer (Trinity University)**[109]***Chair*

Mathews, Jennifer [109] see Abramovich, Lucía

Mathien, F. Joan [197] see Munro, Andrew

Mathwich, Nicole (San Diego State University)**[71]***Embodied Colonialism: Studying the Political Ecology of Colonial Landscape Use from Legacy Collections*

As conservation archaeology increasingly includes extant and legacy collections, researchers are beginning to ask new questions of old materials. Political ecology examines the relationship between politics and the environment and how that relationship affects ecosystems. A political ecology approach toward archaeological collections fits well with collections-based research. While bioarchaeologists have shown the extensive physical and biochemical differences resulting from political and economic inequalities, less attention has been given to the way animals embody power differences. Livestock alter their behavior based on human activity and reflect human labor and resource use. In North America, the abundance of livestock make them particularly attractive as sample sources to study political ecology. In this case study in the Pimería Alta, today southern Arizona and northern Sonora, I examine the political ecology of Spanish colonialism through the embodiment of economic strategies using the stable isotopes of livestock. I show how museum collections extended my study sample to multiple colonial settlements, and enabled me to produce a regional examination of Spanish colonial ranching in the Sonoran Desert. My findings identify proxy evidence for the redirection of resources toward the production of livestock for the Spanish colonial economy, and illustrate how political changes impacted the environment.

Matos, Daniela (University of Tübingen), Manuel Neto (University Mandume Ya Ndemufayo), Christopher Miller (University of Tübingen), Luiz Oosterbeek (Instituto Terra e Memória, Centre of Geosciences) and Nicholas Conard (University of Tübingen)**[11]***The PaleoLeba Project: Linking Human Adaptations and Paleolandscape in the Leba Formation (Huíla, Angola)*

Southwest Angola, located at the western corner of southern Africa, encompasses a mosaic of ecotones from desert, steppe, savanna, deciduous woodlands and tropical vegetation. The edge of the Escarpment draws a natural border between the Namib Desert and the Central Plateau and holds important geological features which are key for characterizing environmental change and human societies of the past. In the Humpata Plateau, between 1800 and 2200 m of altitude, the Leba Dolomites present a vast and complex karstic system forming lagoons, springs and caves, that were used as habitat by animal and human species across the last 1 million years. Here we present the first results of the PaleoLeba Project and the fieldwork developed between 2018 and 2019 to collect evidence on the geomorphology, prehistory and paleoclimate of the region. We present the first mapping of the karstic system (and its fossil infillings) of Southwest Angola and discuss the archaeological data from excavations targeting Late Pleistocene and Holocene deposits of Leba Cave for the understanding of human evolution in Africa.

Matsumoto, Go (Yamagata University), Gabriela de los Ríos (Ministerio de Cultura) and Gabriel Villegas (Proyecto de Investigación Arqueológica Complejo La)**[106]***The Lambayeque Sociopolitical System Viewed from a Multivalley Perspective*

The Proyecto de Investigación Arqueológica Complejo Lambayeque (PIACL) has conducted research at Huacas de Sicán, the

inferred center of the Lambayeque phenomenon during the Late Intermediate Period in the Middle La Leche Valley on the Peruvian North Coast. The site consists of several mortuary mounds, each of which is believed to have belonged to an elite lineage and entombed and enshrined its ancestors. We have argued that the Lambayeque elites attempted to integrate subordinate groups of different cultural identities and to consolidate the multiethnic society through their ancestor veneration cult and associated rituals at the ceremonial core of the site. Our recent survey in the Lower Zaña Valley, however, now provides us with a series of new finds and challenges our conventional view of the Lambayeque sociopolitical system as being highly centralized with its paramount political and religious center in the Middle La Leche Valley. In this presentation, we will argue that the Lambayeque sociopolitical system might have been much more fragmented and present an alternative view that conforms better to our new finds.

Matsumoto, Mallory (Brown University)

[164]

Hieroglyphs and Hegemony in the Classic Maya kingdoms of Piedras Negras and Yaxchilan

The area stretching from the Usumacinta River basin in western Guatemala into the highlands of Chiapas, Mexico, hosted key centers of Classic Maya political and cultural life (ca. 250–925 CE). Scribes and sculptors active across the region produced hundreds of stone monuments inscribed with texts in a common hieroglyphic script. Yet little is known about how these artisans, working in different times and places, acquired and shared knowledge of what and how to write, or how this exchange was inflected by other aspects of inter-polity interactions. This paper presents preliminary results from paleographic analysis of hieroglyphic inscriptions to identify patterns of written variation that reflect scribal change and exchange. It takes as its case study Piedras Negras and Yaxchilan, two antagonistic neighbors in the Usumacinta River valley whose spheres of influence extended to a series of smaller, subordinate settlements. Focusing on visual form, rather than content, of the inscriptions produced in both kingdoms provides insight into the cultural construction of intra- and inter-polity relations. In doing so, this research makes a broader case for studying hieroglyphic texts as material outcomes of cultural production and transmission that can shed light on the contexts of their creation.

Mattioli, Tommaso (University of Barcelona), Angelo Farina (University of Parma), Adriano Farina (University of Barcelona), Elena Miklashevich (Palaeoart centre, Institute of Archaeology, Moscow) and Margarita Díaz-Andreu (ICREA and University of Barcelona)

[25]

Multiple-Input Multiple-Output (MIMO) Impulse Response: An Advanced Acoustic Measurement Technique for Analyzing Rock Art Landscapes

Characterizing the acoustical properties of soundscapes is an important objective in archaeoacoustic research. In recent years, rock art soundscapes emerged as a significant arena for the development of new methods to identify the potential use of sites for ritual activities involving sound and music. Standard parameters are computed from Impulse Response by means of omnidirectional sources and microphones. Although widely accepted, this approach suffers from some limitations due to lack of information about the spatiality of sound. In this paper, we present a new method aimed at characterizing the spatiality of sound propagation in rock art landscapes by taking into account the directionality of both source and receiver (MIMO [multiple-input multiple-output]). This method makes use of a portable spherical array of transducers, individually driven, combined with a HOA microphone and spherical cameras. Data gathered allow us to infer monaural and binaural acoustic parameters, the graphical mapping of sound reflections charted over the panoramic image, a “ray tracing” inverse processing for identifying the path of discrete echoes, and auralization via binaural headphones and VR display. Fieldwork for this paper was undertaken in the Altai mountains (Siberia) in the framework of the ERC Artsoundscapes project (www.ub.edu/artsoundscapes).

[25]

Chair

Mattioli, Tommaso [25] see Coltofean-Arizancu, Laura

Mattioli, Tommaso [25] see Jiménez Pasaodós, Raquel

Mattson, Hannah [244] see Haffner, Jacob

Mattson, Hannah [148] see Norris, Austin

Matu, Marie [171] see Brandt, Steven

Matute, Varinia (University of Calgary)

[209]

Discussant

Matute, Varinia [269] see Acuña, Mary Jane

Mauck, Jessica

[116]

Discussant

Mauldin, Raymond (UT San Antonio), Robert Hard (UT San Antonio), Jacob Freeman (Utah State University), Michelle Carpenter (UT San Antonio) and Cynthia Munoz (UT San Antonio)

[179]

Patterning in Stable Carbon ($\delta^{13}\text{C}_{\text{collagen}}$, $\delta^{13}\text{C}_{\text{carbonate}}$) and Nitrogen ($\delta^{15}\text{N}$) Isotopes of Texas Hunter-Gatherers (7500–850 BP)

Analyses of hunter-gatherer adaptations across the Texas Coastal Plain and into Central Texas allows comparisons of stable isotopic data from two mortuary sites, Morhiss (41VT1), located in the riverine zone 65 km from the coast, and Bering Sinkhole (41KR241), 350 km inland. Morhiss contained over 200 interments (Campbell 1976) while Bering (Bement 1994) contained over 75 individuals. Eighty-nine directly dated individuals from Morhiss and over 70 from Bering demonstrate that both sites were used between 7500 and 850 cal BP. Isotopic data from Bering Sinkhole show dependence on C_4 animals early, with a gradual increase in dependence on C_3 plants and animals through time. Morhiss data show C_3 plant along with freshwater aquatic and terrestrial animal exploitation throughout the sequence, with an increase in C_3 values late. Beyond these dietary trends, there are significant differences in variability between the two sequences. The isotopic data from Bering shows low variability, suggesting that individual diets were similar. The Morhiss data exhibit higher overall variability and a significant increase in the range of dietary isotopic values between 4500 and 2500 BP. That increased variability may indicate reduced mobility and more limited access to other resource zones for some individuals buried at Morhiss.

Mauldin, Raymond [240] see Carpenter, Michelle

Mauldin, Raymond [179] see Munoz, Cynthia

Mauricio, Ana (Pontificia Universidad Católica del Perú)

[59]

Preceramic Human-Ecodynamics and the Development of Monumentality in Lower Chao Valley of Northern Peru

The Pampa de las Salinas archaeological complex of the lower Chao Valley on the northern Peruvian coast was the scenery of the development of preceramic monumental buildings around 5500 cal yrs BP. Here, ceremonial adobe-structures were built during a time of transformation of the local environment associated with a change in the occurrence of El Niño events. Over 3,000 years, Pampa de las Salinas became the center of communal ceremonial activities of this valley, creating a sacred landscape composed by ceremonial buildings, geoglyphs, and productive landscapes. Around 3000 cal yrs BP, Pampa de las Salinas became an abandoned area. The progressive end of this ceremonial center seems to be related with another change in the activity of El Niño phenomenon and the rise of new centers in the interior of the Chao Valley and neighbor valleys.

Maxwell, Judith (Tulane)

[138]

Home Is Where the Fajawala' Are: Making Habitable Space among the Kaqchikel and Other Maya

Mayan communities are located within sacred space. Each town has four principal guardians roughly aligned with cardinal directions and, in pre-contact times, a central altar. Each of the guardians is associated with a landmark (an escarpment, a cave/overhang, a spring or stream, a mountain) and embodies the energy of one of the 260-days of the ritual calendar, cholq'ij. Ceremonies performed at these guardian altars ensure the well-being of the community and offer protection during times of conflict. When refugees from the 35-year genocidal war were repatriated to the Ixcán region of Guatemala, the first task of the ajq'ijaj' "ritual specialists" accompanying these displaced returnees was to identify the locations of the potential guardian energies and establish altars, thus defining the new townsites as Mayan living spaces. On a smaller scale, each new dwelling is imbued with energy during its construction. This energy must be identified and named in a series of ceremonies. It then becomes the household lar or guardian spirit. Energy is immanent within the natural and built world, but it takes Mayan ritual action to define the space as a living place, a place that is alive and one that is suitable for living within.

May, Alejandra (Purdue University), John Rapes (Purdue University), Ben Schiery (Purdue University) and Erik Otárola-Castillo (Purdue University)

[55]

The Effects of Human Predation and Climate Change on the Niche Space of North American Proboscideans

Approximately 13,000 years ago, 37 genera of North American megafauna went extinct. Proboscideans, such as mammoths and mastodons, were among the megafauna affected. Today, researchers continue to debate between three hypotheses to explain these North American Pleistocene mass extinctions: (1) human over-hunting, (2) climate change leading to a reduced niche, or (3) a combination of both. Our previous research suggests that the effects of the warming, drying, and more seasonal climate at the end of the Pleistocene likely caused a competitive environment between mammoth and mastodon seen in a drastic shift in the niche spaces of both species. While ecological theory predicts that competition can drive species to extinction, our original sample was not complete. Here, we expand on our previous work by increasing our sample, including archaeological and paleontological location data and radiocarbon dates, and completing paleoenvironmental reconstructions of key environmental variables. Our objective is to model the effects of climate change and human hunting on the niche space of North American proboscideans within Bayesian hierarchical and Structural Equation causal inference frameworks. This study will enhance our understanding of the changing environments in which these megafauna lived, which may have implications for the study of modern extinction rates.

May, Alejandra [38] see Radican, Kelsey

May, Keith (Historic England)

[24]

Ontological Spatio-Temporal Modeling and the Uses of Allen Operators for Stratigraphic Analysis

Records of archaeological stratigraphic data and the relationships between separately identified stratigraphic units are fundamental

to understanding the overall cohesiveness of an archaeological excavation during fieldwork, analysis, publication and in any resulting archive. Having divided the archaeology into various units for recording purposes, we use stratigraphy, and associated temporal logical relationships recorded between the physical materials as the "reasoning glue" to connect all these different spatial and temporal phenomena, in the form of Stratigraphic Units, Phases, and Periods, back together again, with various narratives to explain our conclusions. For "single context recording" methods widely used in the UK and beyond, most archaeological temporal reasoning is based on the principles of stratigraphic superposition, the "Above and Below relationship" (Harris 1979). But further principles of temporal reasoning are also available (Allen 1983). The CIDOC CRM uses the Allen operators to describe not just superposition but a set of more complex temporal logical relationships that can pertain between archaeological data. This paper will give an insight into how conceptual reference modeling can be used to explore these issues and how associated semantic technologies can enable semantically enriched deductions about the spatio-temporal and purely temporal relationships which fundamentally link such archaeological data together.

[24]

Chair

May, Keith [24] see Moody, Bryony

May Cia, Rossana [230] see Ringle, William

Mayfield, Tracie (University of Southern California) and Danielle Phelps (University of Arizona)

[252]

Pirates and Puritans in the Western Caribbean: Historical Archaeology and Ethnography on Old Providence & Santa Catalina Islands (Colombia)

English settlers colonized Old Providence and Santa Catalina islands in 1629—arriving on the Seaflower, sister ship to the Mayflower— one year after the founding of the Massachusetts Bay Colony in what was to become the United States, but the two colonies had very different historical trajectories. From 1629–1630, colonists, under the direction of the Providence Island Company, constructed a town, New Westminster, and several forts. Around 1836, it became clear that the Islands would not have enough agricultural productivity to sustain the population. Before the Spanish captured the colony in 1641, the Islands were home to nobles, indentured servants, and tenant farmers from Europe, African and Afro-Caribbean slaves, Miskito Indians, Pequot Indians from Massachusetts, and English and Dutch pirates, including William Henry Morgan. Many of the original inhabitants and early settlers stayed on after the colony changed hands and their descendants continue to live on the Islands to this day. In this presentation, we review preliminary data, research outcomes, and lessons learned from the inaugural 2019 field season, which centered on archaeological and ethnographic data collection with the goal of investigating material, temporal, historiographical, cultural, and spatial dialectics on these small, yet highly multicultural, western Caribbean islands.

Mayhack, Connor [8] see Tew-Todd, Victoria

McAllister, Christine (Mesa Verde National Park) and Sheldon Baker (Mesa Verde National Park)

[149]

Ruins Road Site Survey: Then and Now (Results in 1951–52 vs. 2017–18), Mesa Verde National Park

Archeologists from the Mesa Verde National Park Section 106 Compliance crew conducted a survey along a 100' right-of-way corridor on both sides of the park's Mesa Top Loop Road on Chapin Mesa during the 2017 field season and the Cliff Palace Loop Road during the 2018 field season. Together these two loops are known as Ruins Road. 47 archeological sites were recorded in 2017 and 24 archeological sites were recorded in 2018. The area had been originally surveyed in 1951–52 by James Lancaster and others as part of the Chapin Mesa Ruins Survey, and re-evaluated in 1958–59 by Arthur Rohn. This poster compares the results of the original survey with the modern one 66 years later. The results and records differ in level of recordation, detail, and accuracy, while much of the basic interpretation remains the same. One major difference is in the definition of sites and site boundaries. Over the course of both surveys, 23 sites were integrated into larger "parent" sites. Because the earlier crews recorded individual structures as separate sites rather than part of larger habitations, this resulted in incorrect tallies of various site types, particularly single-unit habitation vs. multi-unit habitation (hamlet or village) sites.

McAnany, Patricia (University of North Carolina, Chapel Hill)

[20]

Discussant

McAnany, Patricia (University of North Carolina, Chapel Hill)

[57]

Discussant

McAnany, Patricia (University of North Carolina, Chapel Hill)

[209]

Discussant

McAuliffe, Richard [16] see Roberts, Victoria

McAuliffe, Richard [16] see Roberts, Jerod

McAvoy, Scott [147] see Liss, Brady

McBride, Kevin (University of Connecticut)

[13]

Discussant

[13]

Chair

McBrinn, Maxine (Museum of Indian Arts and Culture, Santa Fe), Julia Clifton (Museum of Indian Arts and Culture, Santa Fe), Amy Montoya (Museum of Indian Arts and Culture, Santa Fe) and Diana Sherman (Museum of Indian Arts and Culture, Santa Fe)

[172]

Donations and Transfers: Recent Challenges at One State Repository

The care and preservation of cultural materials is often viewed by the public to be a vital role of the museum. Consciously or not, museums are seen as "society's attic," a high-quality sophisticated attic that contains valuable and irreplaceable objects, while remaining infinitely expandable. In reality, space is always tight while funds to properly care for the collections are frequently lacking. The mission of the Museum of Indian Arts and Culture is, in part, to safeguard the archaeological heritage of the state of New Mexico through caring for collections made over the past 100 years. This repository, like all archaeological curation facilities, also owes allegiance to the wider field of archaeology and its ethics. Our collections provide snapshots of stages in the evolution of the science during the twentieth century. Donations from private individuals and transfers from other institutions are surprisingly frequent occurrences. The staff at MIAC uses a set of criteria to determine which collections to accept and which to decline. These criteria derive from museum-specific considerations as well as from the broader field. This paper presents our criteria and how they were applied to the decisions on whether to accept a variety of recent donations and transfers.

McCafferty, Geoffrey [133] see Butler, Michelle

McCall, Laura-Isobel [244] see Haffner, Jacob

McCarthy, John (Flinders University), Chelsea Wiseman (Flinders University), Jonathan Benjamin (Flinders University), Jo McDonald (UWA Oceans Institute) and Sean Ulm (James Cook University)

[238]

Evidence for Occupation of Submerged Landscapes of the Australian Continent

The Deep History of Sea Country is a major Australian Research Council-funded investigation of the potential for submerged archaeology in Australia. Nearly one-third of Australia's landmass was drowned after the last ice age and generations of people were displaced by sea-level change. This pioneering, multi-disciplinary study of submerged landscape archaeology in Australia is designed to investigate the records of the now-submerged Murujuga (Dampier Archipelago) coast, spanning 50,000 years ago to present. The project integrates cultural and environmental studies and contributes a unique southern hemisphere insight into world submerged cultural landscapes. A suite of cutting edge marine and aerial survey techniques, including diver survey, has been applied to investigate physical and cultural submerged landscapes, leading to significant discoveries that will change our understanding of Australia's deep history. The outcomes of this project will have significant implications for management of and research into the physical and cultural submerged landscapes of the Australian continent. This presentation will focus on the results of diver survey in the Dampier Archipelago.

McCarthy, Katherine

[84]

The Multiplicity of Murals: Translating Landscapes at Teotihuacan

The murals at Teotihuacan have become a common source of fascination in the archaeology and scholarly considerations of the site. Although the site itself may need no introduction, the murals that decorate its walls have been studied with a level of uncertainty. Often depicting complex and abstract representations of landscapes and deities, these polychrome works created a style that spread from Teotihuacan and was later collected by major museums around the world. The murals become particularly interesting when seen not purely from a decorative or didactic point of view, but rather as activating devices and 3D spaces functioning in two-dimensional depictions. The mural schemes at Teotihuacan serve a cartographic function as well, created as a way for the Teotihuacanos to visually map, understand, and metaphorically access the spaces they inhabited and the realms beyond their reach. In this paper, I will explore the messages mediated by the decorated surfaces of Teotihuacan, and present an alternative view of their function and capacity for transformation in the Classic Period site.

[84]

Chair

McCarthy, Melinda

[44]

Discussant

McCarty, Rita (Mississippi National Guard)**[52]***Using Nonintrusive Technology to Identify Buried Subsurface Cultural Resources at Camp Shelby, MS*

Camp Shelby is a 136,000 acre National Guard training site in south Mississippi. Since its construction in 1917, Camp Shelby has trained our Nations troops for conflicts abroad, as well as domestic disputes and emergencies. Because of Camp Shelby's rich history, all types of cultural resources are found during Section 106 surveys. Within the past five years, the Mississippi Army National Guard (MSARNG) cultural resources section has begun intensive surveys within the Cantonment Area. These surveys include recording above ground features as well as sub-surface resources. Shovel testing is limited in what it can reveal and find, so a new approach using Ground Penetrating Radar has been initiated. This approach has been successful in finding buried WWI infrastructure, as well as identifying the locations of underground tunnels used for training purposes during WWI. This paper highlights some interesting findings related to this on-going Cantonment Area Survey.

[52]*Discussant*

McClain, Brittany S. [194] see Lassen, Robert

McClain, Brittany [194] see Parker, Adam

McClean, Xavier (Xavier McClean), Traci Ardren (University of Miami) and Harri Kettunen (University of Helsinki)**[164]***Establishing Provenance and Analysis of King Wak Chan K'awiil's Bowl*

Over a 60-year period, the Frost Museum of Science, Miami, Florida constructed a substantial collection of Pre-Columbian artifacts, of which one third relate to ancient Maya culture. These artifacts have an established date range from around 200 BCE-1300 CE. An assessment of the collection conducted in March 2014 documented around 400 separate objects with six ceramic vessels identified as strong sources of information due to their displayed iconography. One of these six vessels is the focus of this follow-up analysis and is tagged as the bowl of King Wak Chan K'awiil, a prominent Maya ruler of Tikal dated to the early sixth century CE. Tikal then was under a series of extensive warfare against rival city-states. The bowl is decorated with a statement of ownership associated with elite vessels known as the Primary Standard Sequence. This paper presents a study of this artifact that includes discussion of the artifact's entry into the Frost Museum collection, its epigraphic text, and its likely place of manufacture or use. It is essential to establish context within management of archaeological resources and this study provides an example of how to analyze objects that appear within miscellaneous and unprovenanced museum collections.

McClintock, Thomas (Getty Conservation Institute), Terry Little (Trust for African Rock Art), Janette Deacon (Private Heritage Consultant) and Neville Agnew (Getty Conservation Institute)**[111]***The Rock Art Network: Fostering Support for Rock Art Preservation*

Despite being a valuable cultural asset, rock art is often not understood, respected or valued by the general public. Decision makers and governments offer little support for its protection and valorization compared to other types of threatened natural and cultural heritage. Potential partners are not motivated to provide technical, moral or financial support. Attempts to reach a wider public through museums, exhibitions, books, tourism products, radio and websites have not significantly raised public awareness. To address this, the Getty Conservation Institute brought together specialists from around the world and with a variety of backgrounds to a series of workshops in South Africa, Australia, and Namibia. In 2018, a colloquium in the USA continued this work: 'Art on the Rocks—Developing action plans for public and professional networking' where participants agreed to create an informal body, the Rock Art Network whose purpose is to foster principles of research and conservation, create a network of collaboration with the Bradshaw Foundation website and promote public and political awareness of this irreplaceable heritage. The paper assesses results, challenges with this type of collaboration, and how this network—or any kind of professional network—can thrive and be sustained.

McCloskey, Galen [148] see Portman, Katherine

McConaughy, Mark (PA Historical and Museum Commission)**[99]***Bird Effigies at Sugar Run Mound, Pennsylvania, and North Benton Mound, Ohio*

Bird effigies were constructed from cobble stones at Sugar Run Mound, Pennsylvania, and North Benton Mound, Ohio. Burials were found in direct association with the bird effigies. Birds and bird-like deities were important air symbols to historic Native Americans that were also often associated with the afterlife. Bird symbols associated with burials may represent a belief that the souls of the dead change into birds so they can fly off to the afterlife. Alternatively, they may represent spirit guides that take the souls to the afterlife. Interpretations of the bird effigies at Sugar Run and North Benton Mounds will be explored in this paper.

McConnel, Sean [78] see Richards, John

McConnell, Joseph**[236]***Evaluating "Folsom" Points in the Blackwater Draw Museum's Calvin Smith Collection*

Folsom projectile points are housed and displayed by museums around the country, but many are donated by collectors without

information documenting their original archaeological context. As a result, questions surrounding their authenticity hamper their ability to contribute to collections-based archaeological research of the Folsom time period. A variety of fluted points housed at the Blackwater Draw Museum in Portales, NM, as part of the Calvin Smith Collection bear concave bases, lanceolate shapes, and fluting and may represent Folsom points. Without documentation of their original context their authenticity remains a mystery. This paper presents results of a technological and morphological analysis of Folsom points recovered from a variety of secure archaeological contexts. These data were used to generate a range of variation for authentic Folsom projectile points from the Southwest. Statistical analyses were used to evaluate whether the technological and morphological characteristics of each point from the Calvin Smith Collection fell within or outside of the range of actual Folsom. Results of the analysis indicate that certain points could be classified as Folsom points typical of the Southern Plains region, while others are either from outside of the region or not Folsom at all.

McConnell, Joseph [136] see Stokes, Robert

McCool, Weston (University of California, Santa Barbara), Amy Anderson (University of California, Santa Barbara), Joan Brenner Coltrain (University of Utah) and Douglas Kennett (University of California, Santa Barbara)

[15]

Explaining Trade-offs between Food Acquisition and Violence Avoidance Using a Risk-Sensitive Patch-Choice Model

Resource procurement and the avoidance of interpersonal violence are critical features of human survival strategies. Yet these features are often competing, requiring individuals to make trade-offs in order to maximize fitness. This trade-off will influence population mortality and yield insights into the evolution of violence avoidance behaviors. Recent decades of violence research have shown violence to be a pervasive, albeit variable, feature of the human career. Frequently high levels of violence raise the inevitable question as to what behavioral adaptations have evolved to reduce violence risk (VR), and at what cost? In the following presentation we outline a risk-sensitive patch-choice model that formulates expectations for the optimal patch choice. We predict (P1) that a patch will be avoided when the risk-effect reduces energetic returns below that of than an alternative patch, and (P2) a patch will be utilized at a lower efficiency when the risk-effect does not reduce energetic returns below alternative patches. Further, risk-averse individuals accept reduced energetic efficiency in order to minimize VR, while risk-prone individuals continue to maximize energetics by accepting a higher VR. We test these predictions using human skeletal and stable isotope data and from a prehispanic population of agropastoralists in highland Peru.

[15]

Chair

McCormack, Steve [147] see Varien, Mark

McCorriston, Joy (Ohio State University)

[125]

Discussant

McCorriston, Joy (Ohio State University), Julie Field (Ohio State University) and Henry Griffy (Ohio State University)

[226]

Teaching World Prehistory and the Anthropocene: Some Notes from Our Class [S]pace

What should be our goals as educators and archaeologists in the face of a looming climate crisis? Even as the SAA offers an unparalleled opportunity to discover new research, it also offers an under-subscribed opportunity to talk about teaching archaeology as our curricula and classrooms change. We used backward course design to identify paramount goals in our undergraduate curricular introduction to archaeology. We embarked on a new course design for three reasons: (1) Relevance of archaeology to all our students' lives, (2) Teaching Skills critical to the Anthropocene challenges our students face, and (3) Cultivating Stewardship of our archaeological heritage among our broadly diverse student body. Like most colleagues, we teach and need to keep courses credited in the general education curriculum. Increasing numbers of our students are distance learners, shaping the tools and the processes by which we teach. In this environment, we argue that an Anthropocene approach to teaching archaeology embraces online technologies, promotes sustainability, broadens our outreach as archaeologists, and flips our approach from content delivery to dialogue about the past and its value for the future.

McCorriston, Joy [226] see Field, Julie

McCorvie, Mary [269] see Wagner, Mark

McCoy, Mark (Southern Methodist University), Jesse Casana (Dartmouth College) and Thegn Ladefoged (University of Auckland)

[124]

Field Systems, Urbanism, and State Formation in the Hawaiian Islands

The significance of urbanization and royal centers in the development of productive agricultural systems and state formation has been minimized in the Hawaiian Islands. Today, thanks to several key methodological advances, especially remote sensing using lidar, we are closer than ever to an integrated and fine-grained model of economic, political, and religious developments that speak to historical processes that occurred independently many times in world prehistory. We begin by presenting the results from research on the island of Hawai'i where aircraft mounted lidar has been used to map upland fields at level similar to pedestrian survey over an area of 240 km². Next, we discuss new maps of coastal settlement, including examples of royal centers, created

using the first use of UAV mounted lidar for large scale archaeological survey. Finally, we connect the upland agricultural zone and the coastal habitation zone through a chronology of ritual and monument construction that shows a previously undocumented shift in religious practice that appears to mark the transition to an archaic state society.

McCoy, Mark [147] see Hill, Austin
 McCoy, Mark [77] see Edwards, Nicolette
 McCoy, Mark [262] see Lambert, Spencer
 McCoy, Mark [262] see Mulrooney, Mara

McCoy, Taylor (Eastern New Mexico University) and Heather Smith (Eastern New Mexico University)
[66]

Using Geospatial Methods to Analyze Previous Investigations at Blackwater Draw Locality 1

Blackwater Draw Locality 1 is the Clovis type-site and is located in eastern New Mexico. The site boasts over 85 years of archaeological research conducted by a variety of institutions and researchers. The site is 640 acres in size, contains multiple activity areas representing multiple time periods that, despite decades of research, still have the potential to answer important questions regarding human adaptation throughout the late Pleistocene and Holocene epochs. Specifically, an inclusive geospatial study of the locality has yet to be conducted. The goal of this project is to synthesize the available spatial data collected on archaeological materials and geoarchaeological features into an ArcGIS database, making it easier to study the locality, propose new research, and address questions concerning spatial variation in human adaptive behavior across the locality. Here I address the capability of digital methods of spatial data management and analyses to allow researchers to examine Blackwater Draw in its entirety across time and space. As a locality that has been excavated and researched using many methodological approaches and research goals, I hope to provide an avenue to address new research questions that have, until now, been impossible.

McCoy, Taylor [77] see Smith, Heather

McCreary, Helen [107] see Gaffney, Chris

McCreary, Shane [190] see Levin, Samuel

McCuiston, Emily
[177]

Radiocarbon Dating the Lower Pecos Canyonlands and Evergreen Rosette Plant Baking

The Lower Pecos Canyonlands (LPC) archaeological region of southwest Texas is located at the eastern limit of the Chihuahuan Desert and southern limit of the Great Plains, centered on the confluence of the Pecos River and the Rio Grande. Exceptional organic preservation in the region's dry rockshelters has beckoned archaeologists for 90 years, and excavations have yielded an abundance of datable materials, including fiber and wooden artifacts, coprolites, quids, and charred remains from earth oven plant baking. Earth oven facilities were built in most of the region's large rockshelters, evidenced by burned rock midden talus spilling from their entrances. Earth oven facilities were also built on river terraces and uplands. Plant baking of evergreen rosettes (e.g., agave and sotol) is important to discussions of diet breadth and intensification in the region. The LPC radiocarbon record consists of over 400 assays spanning the Paleoindian through Proto-historic periods. The assays have been critically vetted to identify potentially unreliable or irrelevant dates. Using Bayesian methods, the radiocarbon data are used to investigate timing and frequency of plant baking. Interrelated topics are also explored with these data, including the manufacture of fiber goods from evergreen rosettes, intermittent presence of bison, and human population fluctuations.

McCurdy, Leah (University of Texas, Arlington)
[20]

Construction Workers: Ancient Maya Building Labor Systems and the People Who Labor

This paper focuses on an architectural history and energetic analysis of ancient Maya monumental construction at El Castillo acropolis during the Late Classic period at Xunantunich, Belize. One major analysis of that larger study concerns labor projected from energetic estimates. For example, projections of quarry labor at global, regional, and local scales can result in interpretations of labor supervision and workgroup composition. One of the less evidenced, but nonetheless interesting, extensions of this analysis can lead to considerations of the personal investment of labor. By extrapolating from the local scale, we can consider individual laborers and what sorts of impacts their experience in the quarry would have had in their lives. We can also explore agency in the building process, at the finest scales, and the phenomenological perspectives of the people who actually did the building. This paper explores that humanized or 'peopled' view of monumental construction.

McDaid, Chris (U.S. Air Force, Fort Eustis, VA), Patrick Barry (Colorado State University), Courtney Birkett (Colorado State University) and Scott Seibel (AECOM)
[9]

Monitoring, Planning, and Treating Archaeological Sites for Climate Change

The Fort Eustis portion of Joint Base Langley-Eustis is a peninsula of 8,000 acres bounded by Skiffes Creek, the Warwick River, and the James River on Virginia's coastal plain. The installation has 233 identified archaeological sites. Thirty-one sites are subject to erosion by the surrounding waterways. Beginning in 2010, the installation instituted a site monitoring program to document the physical status of the sites. Data from that program revealed many sites were being impacted by erosion. The installation developed

a system to quantify current and potential future erosion damage for the thirty-one sites being damaged, as well as a system to prioritize and triage the sites for future study and treatment. Since developing the system, the installation has recorded erosion data to verify the model, worked to identify sites warranting stabilization, and stabilized significant sites. Additional analysis of the types of sites being threatened indicate a disproportionate number of Woodland period sites (1200 BCE–1600 CE) being impacted by erosion than was expected, a finding that the installation is accounting for as it plans for future preservation activities in consultation with federally recognized Native American Tribes with ties to the installation.

McDaid, Christopher [256] see Baxter, Carey

McDermott, Michael (Humboldt State University), Jeremy McFarland (Humboldt State University) and Marisol Cortes-Rincon (Humboldt State University)

[7]

Understanding Landscape Modifications: Water Management in the Maya Lowlands of Northwestern Belize

The archaeological understanding of how ancient civilizations used and transformed the landscape has significantly improved with the growing availability of lidar. The Maya significantly modified their landscape for religious and practical purposes; cultural modifications used for water management and catchment is an important study area to better understand settlement patterns. The goal of this study is to gain an understanding of a network of linear features, exposed through lidar visualizations, and their impact on water management in the Dos Hombres to Gran Cacao Archaeological Project (DH2GC) area. This project will utilize GIS hydrology toolsets, a lidar dataset, and other geospatial applications, to model and compare small scale surface water distribution under various hydrological and landscape scenarios of three study sites, with the goal of applying it to a regional analysis in the future.

McDermott, Michael [230] see Cortes-Rincon, Marisol

McDermott, Michael [206] see McFarland, Jeremy

McDonald, Jo [238] see McCarthy, John

McDonald, Morgan [63] see Russ, Jon

McDonough, Katelyn (Texas A&M University) and Jaime Kennedy (University of Oregon)

[195]

Paleoethnobotany of the Connley Caves, Oregon: Investigating Great Basin Paleoindian Plant Food Economies

Questions concerning human paleoecology and subsistence strategies continue to shape Paleoindian research in the Great Basin. Despite significant advances in our understanding of human lifeways during the terminal Pleistocene, the relationship between human populations and plant food communities is still unclear. Specifically, what was the role of plants in the food economy of early Great Basin foragers? How did changing climatic conditions affect plant communities and how did humans respond? Archaeobotanical data are required to address such questions, but preservation of perishable materials is rare. The Connley Caves in central Oregon provide a unique opportunity to address these longstanding issues. Recent excavations at this site uncovered multiple Younger Dryas age (ca. 12,900 to 11,600 cal BP) cultural components containing extensive Western Stemmed Tradition tool assemblages, multiple hearth features, and preserved organics. This paper presents results of the paleoethnobotanical analysis examining seasonality of site occupation and patterns of plant exploitation throughout the Younger Dryas.

[195]

Chair

McDonough, Katelyn [170] see Jenkins, Dennis

McDonough, Katelyn [66] see Quiroz, Itzel

McDonough, Katelyn [66] see Saper, Shelby

McElfresh Buford, Katie (Missouri State University) and Billie Follensbee (Missouri State University)

[191]

Finding the Right Niche: Altar, Throne, Stela, Sarcophagus? Overlap and Ambiguity in Olmec Large Stone Sculpture

Among the most diagnostic sculptures made by the Gulf Coast Olmec is the table-top altar/throne. This sculpture is best known for its most common features: a wide, heavy cornice, a generally rectangular structure, and often, a niche in the front. Given the table-top form, scholars originally interpreted these sculptures as altars, but many are much too large to have served as a sacrificial platform. Apparently resolving this enigma was Grove's discovery of the Oxtotitlan Cave painting illustrating an elaborately garbed figure seated upon a throne, with supernatural imagery depicted on its heavy cornice, which is very similar to that on the Olmec sculptures. The recognition and continued excavation of Olmec and Olmec-related sites have continued to add to the repertoire of Olmec sculptures—but have also introduced ambiguity and uncertainty into traditional sculpture categories. Some sculptures currently designated as thrones do not have niches but large, supernatural faces or multiple figures, while others may be lids to stone boxes, stelae, or another type of niche figure. A study of altar/throne and niche figure variations, of the overlap of forms and imagery, and a re-evaluation of possible functions, all together provide new insights into our understanding of Olmec sculptures.

McFarland, Douglas [8] see Brown, James

McFarland, Jeremy (Humboldt State University), Michael McDermott (Humboldt State University) and Marisol Cortes-Rincon (Humboldt State University)
[206]

Landscape Ecological Zone Classification Using Airborne Laser Scanning Data in Northwestern Belize

Understanding human-environment interaction, landscape utilization and where people choose to settle are some major questions in Maya archaeology. However, a lack of regional scale ecological zone mapping has been a disadvantage in answering these types of questions. Light Detection and Ranging (lidar) is a leading tool in collecting the most comprehensive and accurate data for measuring vegetation structure and classifying ecological zones on a regional scale. In 2016, a total of 274.6 km² of lidar was flown by the National Center for Airborne Laser Mapping (NCALM) for a consortium of archaeologists under the auspice of the Programme for Belize Archaeological Project (PbAP), located in northwestern Belize. Using ground truth data collected from the Dos Hombres to Gran Cacao Archaeology Project (2009–2019), criteria can be used to define environmental zones and with secondary derived lidar datasets, a decision tree model can be developed to identify these zones within the whole study area. An investigation of the different ecological zones in the study area will help answer questions on ancient settlement choices and how these different zones were exploited.

McFarland, Jeremy [230] see Cortes-Rincon, Marisol

McFarland, Jeremy [7] see McDermott, Michael

McFarland, Jeremy [53] see Mitchell, Spencer

McGilvray, Julie [165] see Gearty, Erin

McGlothlin, Teka [166] see Trubitt, Mary Beth

McGowan, Glenys [240] see Edington, Stacy

McGowan, Glenys [234] see Miller, Ian

McGrath, James (University of Iowa), Brandi MacDonald (University of Missouri Research Reactor) and Curtis Marean (Arizona State University)
[5]

The Sourcing of Archaeological Mineral Pigments from PP5–6, Western Cape Province, South Africa via NAA, XRD, and SEM-EDS

Artifact sourcing data are useful for testing hypotheses about variation in human mobility, territory size, or the extent or nature of exchange networks. Here we report the results of a recent sourcing analysis of 35 archaeological mineral pigments from Pinnacle Point 5–6 (PP5–6) and the inferred changes in landscape use between MIS 5b and MIS 3 in the study area. This current study builds on the dissertation work of Bernatchez, who conducted a survey of the research area and initial compositional characterization of the PP5–6 mineral pigments. This poster outlines more recent tests utilizing NAA, XRD, and SEM-EDS to assess the association between archaeological mineral pigments from PP5–6 and five deposits previously identified by Bernatchez. Results of this study suggest that the Late Pleistocene occupants of PP5–6 likely utilized at least three mineral pigment deposits: 1) the primary local deposit previously identified by Bernatchez, 2) another of Bernatchez's possible local deposits, and 3) a third (or more) unknown deposit(s). Additional research is needed to assess whether the unknown deposit(s) is local or non-local. Use of these mineral pigment sources varied through time at PP5–6. This variation sheds light on shifting landscape use between MIS 5b and MIS 3.

McGuire, Kelly (Far Western Anthropological)

[58]

The 40-Year Ride: Far Western Anthropological Research Group and the Past, Present, and Future of CRM

Starting as a small nonprofit of like-minded graduate students in anthropology, Far Western has emerged as one of the largest and most respected companies in CRM. Sometimes by design, more often by simply responding to the daily challenges and opportunities at hand, Far Western has put together a 40-year run. This run has continued through generational turnover of company staff and among our agency counterparts; an ever-evolving political and regulatory landscape; advances in information systems and other technologies; and rising Native American participation and empowerment, to name but a few of the forces affecting CRM. Is there a “secret sauce” to all this? Probably not, but it's worth reflecting on how we all got here and where we might be going.

McGuire, Randall (Binghamton University), Elisa Villalpando (Centro INAH Sonora), Alejandra Abrego (Centro INAH Sonora), Hunter Claypatch (SUNY, Binghamton University) and Cinthia Campos (SUNY, Binghamton)

[79]

Digging the Trincheras Tradition in Sonora, Mexico

The international border between the U.S.-Mexico has long served as a barrier to integrate archaeological research in the Sonoran Desert. The Trincheras Tradition Project has been working in northern Sonora, México since 1985. This project bridges the border with collaborative archaeological research by Binghamton University and the Centro INAH, Sonora. In the fall of 2017 and 2018, we completed NSF funded excavations in three Trincheras Tradition sites in the Altar Valley, near Átil, Sonora. These three sites yielded components including the Early Agriculture Period, the Trincheras Tradition (two phases), the Hohokam Tradition and the Proto-Historic O'odham. The project will use these data to answer questions about the Trincheras Tradition, specifically its relationship to the Early Agriculture Period and to the Hohokam and O'odham Traditions. This will greatly increase our understanding of cultural developments in the Aboriginal Sonoran Desert.

McIntosh, Brandon (Washington State University) and Erin Thornton (Washington State University)**[76]***Osteometric and Morphometric Analysis of Archaeological Turkey Assemblages from across the Mogollon Region of the U.S. Southwest*

This poster reports on the osteometric and morphometric analyses of archaeological turkey bone from sites dating from the Early Agricultural Period (before AD 400) to the late Formative Periods (ca. AD 1450) across the greater Mogollon Region of the U.S. Southwest. This span of time covers the introduction and intensification of turkey husbandry in the Southwest. The data presented here are part of a larger study in the Mogollon Region that combines osteometrics, morphometric, stable isotope and ancient DNA analyses to investigate turkey domestication in the southern regions of the Southwest. Research over the past decade has revealed turkey management strategies were highly variable across the northern Southwest. This study extends this research into the Mogollon Region, an area of the Southwest that has not yet received this level of investigation into turkey domestication. Through morphometric analysis, turkey husbandry strategies are revealed by documenting the population structures of managed flocks allowing for a more nuanced understanding of how turkeys were used in the ancient Southwest. Understanding variability in how humans managed turkeys in the Mogollon Region provides a much wider view of a highly complex domestic relationship across the Southwest in general.

McIvor, Locke (New Mexico State University)**[177]***Modeling the Hidden Panel Site*

Rock art in the Big Bend region of West Texas remains an understudied area. In this poster I explore the Hidden Panel Site, a Late Archaic (250 BC to AD 350) Diablo Dam style site that overlooks Chalk Draw. Three kinds of motifs are present at the site, projectile dart points (basally notched), abstract geometrics and a figure that seems to relate to the horizon landscape of the draw. I will focus on building a Structure for Motion (SfM) model of the site, to understand these motifs and how they possibly relate to the site in ritual ways. The model will emphasize use of landscape views, movement through the site, and relating to the premise of light.

McKay, Kristin [183] see De Guzman, Margarita

McKechnie, Iain [271] see Gustas, Robert

McKee, Brian (University of Arizona)**[93]***Discussant***McKeeby, Zachary (University of Virginia)****[216]***Iron Production and Variation in Machili: Recent Archaeological and Geophysical Survey in Western Zambia*

The Machili watershed in western Zambia formed a politically decentralized frontier zone for nearly a millennium as a sequence of kingdoms, states, and trading networks were forged and dissolved on its periphery circa 700–1500 CE. While the Machili Valley itself contains no evidence of political centralization, the presence of copper ornaments and cowrie shells at several sites confirms direct or indirect connections with the Swahili coast, the Copperbelt region, and nearby regional polities between the Zambezi and Limpopo rivers. Limited archaeological surveys in the late 1960s tentatively fit the Machili Valley into a larger context of Iron Age life in Zambia, and into south-central Africa more broadly. This paper details early results from new survey work in Machili. A combination of geophysical and shovel-test survey methods were used to re-survey previously documented sites, identify new sites, and to study localized variations in iron production practices in the Machili Valley in the absence of, and on the periphery of, state-level control. Results suggest geographic and temporal changes in settlement patterns, changes in smelting practices, and changes in the spatial relationship between domestic areas and areas related to iron working such as furnaces and forges.

McKenna, Kathryn, Tim Baumann (University of Tennessee, Knoxville), Gerry Dinkins (University of Tennessee, Knoxville) and Steve Ahlstedt**[78]***Check Out These Mussels: Gravel Hill Cave Site Mussel Analysis in Comparison to the Clinch River Breeder Reactor Plant Site.*

The Gravel Hill Cave Site (40RE117), located along the Clinch River, was excavated by Bill Fischer in 1958 as a personal curiosity. The site contained a unique stratigraphy of mollusks comprised of over 50 species, indicating an extended period of occupation ranging from Late Archaic to Early Mississippian. This paper analyzes the site's chronology of mollusks in comparison to 40RE108, an open-air site located downriver. The comparison of these sites and their similar abundance of freshwater mollusks species and various artifacts spanning several periods will contribute to a greater understanding of change over time in past occupation in East Tennessee.

McKenzie, Emily (University of Alabama) and Katherine Chiou (University of Alabama)**[241]***Out of the Frying Pan and into the Fire: Measuring the Effects of Charring on Chile Pepper (*Capsicum* spp.) Seed Morphology*

The chile pepper (*Capsicum* spp.) has cemented its place amongst New World peoples in prehistory as a fixture in medicine, ritual, and cuisine. The timing and context of its domestication and spread throughout the precolumbian Americas, however, remains

unclear. Previous work on the identification of chili pepper seeds to species-level resulted in the development of identification keys for the five domesticated *Capsicum* species (*C. annuum*, *C. baccatum*, *C. chinense*, *C. frutescens*, and *C. pubescens*). This work, however, was conducted on modern seeds preserved through desiccation. In order to understand the taphonomic impact of carbonization on chili pepper seed morphology, we measured the effects of charring under various experimental conditions on modern chili pepper seeds. Through our comparison of the uncharred and charred morphology of our specimens, we are able to determine how chili pepper seeds are affected by charring, contributing to ongoing efforts to track the adoption and movement of chili peppers in the ancient Americas through morphometric methods.

McKenzie, Emily [147] see Hatcher, Lawford

McKenzie, Nancy [187] see Cagney, Erin

McKeown, Ashley [169] see Izzo, Victoria

McKeown, Ashley [215] see Karastamatis, Kallista

McKeown, C. Timothy

[49]

Discussant

McKinney, Holly [82] see Doering, Briana

McKinnon, Jennifer [221] see Bush, Dominic

McKnight, Matthew (Maryland Historical Trust)

[251]

Contact on the English Periphery: Evidence of Native-Colonial Interactions in the Monocacy Valley

In 2013, after a 43-year hiatus in archaeological attention, the Maryland Historical Trust and its partners returned to the Biggs Ford prehistoric village (18FR14) in Frederick County, Maryland. They did so expecting to investigate two Late Woodland components: a Montgomery Complex settlement and a large, palisaded Keyser village. What they did not expect to find were European trade goods revealing a Native American presence that endured on the landscape much longer than presumed. This paper discusses unpublished evidence of a late seventeenth or early eighteenth-century occupation at the site and examines both the ethnohistoric and archaeological evidence for Native settlement and interaction with Europeans near the Monocacy/Potomac confluence. The historic record reveals that the Monocacy Valley around the turn of the eighteenth century was a dynamic landscape inhabited by multiple Native groups, frequented by European traders of diverse backgrounds, and a disputed frontier territory claimed by both the Maryland and Pennsylvania English.

McLaren, Whitney [52] see Skinner, Dougless

McLeester, Madeleine (University of Notre Dame) and Jesse Casana (Dartmouth College)

[124]

Locating Wisconsin's Past Indigenous Agricultural Landscapes Using Historical Aerial Photography

Wisconsin has the largest number of recorded precolumbian and early historic Indigenous ridged and hilled field systems in the American Midwest, with over 450 known examples. But twentieth-century land use practices have destroyed or obscured more than 90% of these sites. Leveraging a comprehensive database of high-resolution aerial photographs dating to the 1930s, alongside both modern aerial imagery and public lidar data, we systematically analyze sites in the Wisconsin River drainage basin where Indigenous agricultural features were previously recorded in order to determine whether such features could be resolved in historical imagery. Here, we present both our successes and challenges in detecting and interpreting archaeological field systems, effigy mounds, and other features in 1930s aerial photographs. Results offer new perspectives on Upper Mississippian agricultural landscapes and highlight the potential of historical aerial photography to reinterpret known sites as well as discover previously unrecorded sites and features in regions that have been heavily impacted by modern development.

[124]

Chair

McLeester, Madeleine [124] see Casana, Jesse

McMahon, Todd

[248]

Developing a Resilient Colorado Curation Model: The Innovative Solution to Addressing the State's Collections Care Needs

Colorado was for many years the center of a curation crisis. In response, Colorado relied on the establishment of somewhat informal partnership institutions, such as universities, small local museums, and local regional repositories that have now been strengthened by creating rules and procedures that have allowed turnkey, scalable, politically neutral, regional solutions to the State's

archaeology and natural history specimen's care needs. The State of Texas Curatorial Facility Certification program served as the legal framework model that was modified and applied to Colorado. Instead of a separate certification program however, Colorado relies on national and regional museum "accreditation" and assessment programs to build resiliency within the curation network. The network also hopes to expand the ability for repositories to obtain trained volunteer assistance as well as museum studies students and offer opportunities to museums to obtain grants for re-housing or interpretation. The end goal then is a program that we feel is beneficial to all parties, as it strengthens local museum's collections care, their access/use, and helps to promote a greater appreciation for existing collections.

McNamee, Calla (Wiener Laboratory for Archaeological Science, ASCSA), Neil Weintraub (Kaibab National Forest) and Daniel Sorrell (Western Cultural Resource Management)
[255]

Celebrating Decades of Collaboration: Interpretations of Grand Canyon Puebloan Land Use in the Upper Basin, Northern Arizona
Situating near the Grand Canyon, the Upper Basin has been largely overlooked in archaeological research, with study focusing on easily accessible, larger, and often romanticized sites in surrounding areas. Through decades of work, Alan Sullivan, however has demonstrated the Upper Basin's importance for enhancing our understanding of the diversity of cultural practices employed in the prehistoric Southwest. Our paper builds on intensive survey conducted during Sullivan's Upper Basin Archaeological Research Project (UBARP), by utilizing the extensive GIS and site databases from the Kaibab National Forest (KNF). We couple site locational data with tabular data on size, architectural features, and artifact concentrations to investigate questions of changing occupation, community organization, and land use. Our data confirm UBARP's finding of intense occupation by Pueblo II community clusters around small ephemeral drainages, while establishing the continued use of the area during the Pueblo III period. In the identification of recent post-fire dense fetid goosefoot growth, KNF archaeology survey work has also contributed to Sullivan's emphasis on the importance of anthropogenic burning and wild resource cultivation for prehistoric populations in the area. The combined UBARP and KNF research is a testament to the importance of collaboration for enriching our knowledge of regional archaeology.

McPherron, Shannon. P [36] see Abdolazadeh, Aylar

McRostie, Virginia (Pontificia Universidad Católica de Chile)
[74]
Chair

McRostie, Virginia (Pontificia Universidad Católica de Chile), Eugenia Gayo (Center for Climate and Resilience Research), Claudio Latorre (Departamento de Ecología & Centro UC del Desierto) and Calogero Santoro (Universidad de Tarapacá)
[171]

Humans, Plants and Animals: Landscape Transformation and Management during the Formative Period of the Atacama Desert
Camelids played a key role in the adaptation of societies to the Atacama desert. It's by the Formative period that traces of llamas became ubiquitous within different archaeological sites located on wetter niches from the hyper arid core. Human colonization of these ecosystems dialogues intensively with these animals. During this period a rise in humidity and the eclosion of legumes forests complemented by Andean crops fueled a new social scenario. Semi-sedentary villages started to emerge, becoming highly dependent on caravans that travel through the desert transporting the required supplies. During previous periods evidences of camelids were found mainly in the highlands, and it has been proposed that these animals were hardly adapted to the lowlands. To get a better understanding of these landscape transformation during the Formative, we analyze the diet of these animals, which have not been assessed in the area before. Cuticles from several plants are expected to be found in their coprolites. By identifying these plants and their patterns through different sites, we can read how human societies managed and established a resilient system in this hyper arid area. Permanent settlements intimately tied humans, plants and animals and therefore these ecological relations needs to be uncovered.

McRostie, Virginia [74] see Ugalde, Paula

Mdludlu, Ayanda [11] see Collins, Benjamin

Meadow, Richard [162] see Borreggine, Marisa

Means, Bernard (Virtual Curation Laboratory)
[17]
Discussant

Means, Bernard (Virtual Curation Laboratory)
[56]

"They left about the time I could begin to depend upon them": Helen Sloan Daniels and the National Youth Administration Durango Public Library Museum Project

One of the lesser known programs that funded archaeological excavations during the Great Depression was the National Youth Administration (NYA). NYA archaeology has been overshadowed by projects funded by its more prominent "cousin," the Civilian Conservation Corps (CCC), and its older "sibling" the Works Progress Administration (WPA). Helen Sloan Daniels, who lived all but

four years of her life in Durango, Colorado, made both minor and major contributions to the archaeology and ethnology of the area around her home town. Here, I focus on her work from 1936 to 1940 with the Durango Public Library Museum Project, which employed shifting—and small—numbers of young men and women provided by the NYA. Daniels actively worked with professionals on her project, consulting with them as she could. She and her technical advisor, I. F. Flora, made a particular effort to recover material suitable for the then relatively new technique of dendrochronology. Samples recovered by the NYA workers extended the local tree ring chronology back to AD 253.

Meanwell, Jennifer (MIT), Elizabeth Paris (U. Calgary) and Roberto López Bravo (UNICACH)

[196]

Micromobility of Potters in the Jovel Valley, Chiapas

The Jovel Valley of highland Chiapas is home to a variety of Late Classic and Early Postclassic Maya centers, including the sites of Moxviquil and CV-38 discussed here. Recent excavations suggest that settlements on the valley floor, like CV-38, were largely abandoned during the Early Postclassic period and that the residential zones of hilltop centers like Moxviquil expanded greatly, suggesting changes in settlement and population movements away from valley floor centers. An earlier study of pottery from Moxviquil suggests that potters in the Early Postclassic period were utilizing a variety of resources to make vessels, particularly clays mixed with volcanic ash and intermediate sands from the Huitepec volcanic dome on the west side of the valley. However, the valley floor and surrounding escarpments are mainly calcareous. Although these resources were still utilized to a limited extent in the Early Postclassic, potters likely had to transition from valley clay and temper sources to new resources in the hills when they abandoned the valley sites. This study looks at utilitarian pottery within the Jovel Valley during this time of population movement to investigate how potters selected and changed their production to react to different local raw materials.

Medchill, Brian [229] see Morgan, Linda

Medina Hernández, Abril Ameyalli (CEA UNAM) and Fabiola Fernanda Hoyos Velasco (CEA UNAM)

[121]

Mitología y cosmovisión maya

Dentro de lo que hoy en día conocemos como astronomía, ésta no se basaba en explicaciones “científicas,” pues la observación del cielo en Mesoamérica se vinculaba con la estructura ideológica de la sociedad. En este sentido, la astronomía maya se haya estrechamente concernida tanto con los mitos como con la religión, ya que dicho conocimiento se empleaba para la explicación de la vida y el universo. Dicho esto, en lo que pretendemos indagar es en cómo los animales se relacionaban con fenómenos astronómicos y naturales, ya que por ejemplo con frecuencia al jaguar se le asociaba con la luna o la noche, y a la serpiente con la frialdad y cuerpos de agua, esto mediante información extraída tanto de fuentes históricas como epigráficas, y de igual forma analizar aspectos culturales que se presentaba al haber una asociación con estos animales.

Medina Martínez, Lorena

[165]

Análisis arqueológico de un predio en el centro histórico de la Ciudad de México

El surgimiento de la capital de la Nueva España en el siglo XVI fue un proceso sumamente importante. De entre las innovaciones que se dieron se encuentra la arquitectura doméstica que se construyó directamente sobre las ruinas de lo que fue la capital azteca. Esta arquitectura tenía que adaptarse a las características del terreno, a la necesidad de construir sobre las ruinas del previo emplazamiento, a la reutilización de materiales de construcción y la rápida enseñanza a los indígenas para construir en poco tiempo un nuevo estilo arquitectónico que hasta ese momento había sido desconocido para ellos. Con todo lo anterior, esta presentación analiza los aspectos antes mencionados así como las diferentes ocupaciones que se han dado en el predio ubicado en la calle de Justo Sierra, dicho análisis inicia con la ocupación prehispánica del período posclásico tardío hasta nuestros días. Así, se propone analizar los restos arqueológicos arquitectónicos para entender como fue ocupado este espacio de la capital novohispana así como entender como se fueron modificando los elementos arquitectónicos y la distribución espacial del predio a través de los años.

Medina Rosas, Axayacatl (Student CEA-UNAM)

[121]

Identidad en función de las Unidades de Convivencia, en el sitio arqueológico de Corral de Piedra, en el estado de Durango, México, durante el siglo X

Las unidades de convivencia son configuraciones espaciales, arqueológicamente compuestas por estructuras arquitectónicas, sus elementos materiales contenidos y su entorno ambiental inmediato, en función de las cuales se puede discutir sobre la relación entre identidad y espacio; considerando que ciertos aspectos de la identidad quedan plasmados en las relaciones de posicionamiento y utilización, entre elementos naturales y/o culturalmente generados, como resultado de la apropiación espacial. Por lo que, las estructuras arqueológicas del sitio de Corral de Piedra, en el estado de Durango, cuya ocupación ha sido datada durante el siglo X, representan un punto de partida para construir un acercamiento en torno a la identidad de quienes ahí habitaron, en un sentido de pertenencia a agrupaciones de convivencia habitual.

[121]

Chair

Mehmetaj, Haxhi [263] see Baci, Erina

Mehta, Jayur [18] see Hollingshead, Analise
 Mehta, Jayur [222] see Ostahowski, Brian

Meierhoff, James (University of Illinois, Chicago), Paula Bryant (Illinois State Archaeological Survey), Paula Porubcan (Illinois State Archaeological Survey) and Artur Stasiek (University of Glasgow)
 [213]

Archaeology of the WWII German Prisoner of War Branch Camps of Chicago

WWII came to the American Homefront in the form of hundreds of thousands of German Prisoners of War. The captured combatants were initially housed en masse at large base camps, but many smaller branch camps were established in the American hinterlands to put the prisoners to work in local industries. While a largely forgotten aspect of the war, the nature of this labor put prisoners from these branch camps into much closer contact with American citizens and their communities, while simultaneously generating large sums of revenue for the U.S. Army. In the Chicago suburbs, German prisoners were installed within repurposed Civilian Conservation Corps facilities to fulfill the need for wartime labor. Today, three Chicago branch camps are archaeologically preserved within the boundaries of the Forest Preserves of Cook County. This poster discusses the archaeological research investigating the transformation of these spaces from footprints of Roosevelt's New Deal social programs into places of incarceration. The recent analysis of a copious early mid-century ceramic midden informs on the provisioning of such camps, while the identification of the POW enclosure at the large Skokie Valley camp shows parallels of segregation and exclusion also seen during the era of the CCC.

Meierhoff, James [160] see Porubcan, Paula

Meinekat, Sarah [180] see Rademaker, Kurt

Mejía Ramón, Andrés (Pennsylvania State University), Nadia Johnson (Pennsylvania State University) and Christian John (University of California, Davis)
 [189]

A Bird's-Eye View of Power: Subsistence, Monumentality and Water Ritual in Ancient Teotihuacan

Proponents of collective and autocratic models of Teotihuacan's sociopolitical organization relate the control and ritual of water to the development of complex society, but how such institutions materialize on the landscape remains poorly understood. We present evidence from six-years of archaeological survey, excavation and remote sensing, suggesting that large amounts of energy and social capital were invested in the construction and maintenance of systems to capture broadly-distributed rainwaters. Wide, shallow canals—dammed at semi-regular intervals—served to retain highly erosive runoff while making waters available for diversion irrigation and other purposes. Evidence of such systems exists in the contemporary archaeological record among the barrancas of the Southern Teotihuacan Valley. These tiered reservoir systems were of sufficient importance to the builders of the ancient city that they were monumentalized and memorialized in the construction of the Street of the Dead, which served as the destination of a significant portion of the valley's re-routed floodwater networks. This spatial and hydraulic axis mundi was incorporated into the ideology and state ritual of Teotihuacan in radically different ways by different rulers, suggesting dramatic constrictions in political accessibility as the city expanded, despite political origins rooted in broad-based public legitimacy.

[189]

Chair

Melendez, Juan (Washington University, St. Louis) and Emiliano Melgar (Museo del Templo Mayor)
 [54]

Approaching the Craft Production of Greenstone Tesseræ that Form Ancient Maya Mosaic Masks from a Technological Perspective

Craft production during the Classic Maya period was undoubtedly diverse and complex. One area that remains poorly understood, due to the little evidence recovered to date, concerns the tools used by ancient artisans in the craft production of greenstone prestige goods. One persistent question remains: what were the raw materials of the tools used to manufacture specific sets of jewels? To address this question I consider greenstone tesseræ that form 13 ancient Maya mosaic masks and present a technological study based on micro-archaeological approaches. These prestige goods were found in Classic period tombs (AD 300–750) of high-elite individuals from Tikal, El Zotz, El Perú-Waka', and El Tintal. My results suggest that limestone, jadeite, and hide were the main raw materials of the tools used to provide the polished appearance on the anterior sides of the greenstone tesseræ, while to cut their edges obsidian was preferred. I interpret these results as indicative of a standardization in the production of a specific set of jewels, namely the tesseræ that form the greenstone mosaic masks.

Melendez, Juan [166] see Aquino, Daniel

Melgar, Emiliano (Museo del Templo Mayor-INAH) and Reyna Solís (Museo del Templo Mayor-INAH)
 [10]

Archaeometry of the Lapidary from Xalla and the Identification of Teotihuacan Relics in Tenochtitlan

The new archaeometrical characterization of the lapidary objects from Xalla allowed us to distinguish local and foreign goods among this palace compound inside the multiethnic settlement of Teotihuacan. In this paper, we will present different non-destructive techniques (UVF, IRR, OM, SEM-EDS, and μ Raman) employed on this lapidary assemblage to identify their chemical composition, mineralogy and provenance, and the characterization of their manufacturing traces. Using these methods, we detected raw materials from diverse geological origins, like jadeite, green quartz, serpentine, travertine, and amazonite, among others. With the traceological analysis, we distinguish four technological patterns. The comparison of them with the lapidary traditions developed in

Classic Mesoamerica allowed us to identify them as Teotihuacan, Maya, and Zapotec. Also, we note specific relationships and cultural preferences between some types of raw materials, objects, and techniques. Finally, the temporal and spatial comparison of these lapidary items with other sites, like the Great Temple of Tenochtitlan, confirmed the existence of lapidary relics with the Teotihuacan technological style in Postclassic sites.

Melgar, Emiliano [54] see Melendez, Juan

Mellet, Claire [238] see Tizzard, Louise

Meltzer, David [173] see Vander Linden, Marc

Menaker, Alexander (University of Texas-Austin)
[200]

An Interloping Inka in the Valley of Volcanoes

The Andagua Valley is composed of lava flows, volcanoes and anthropogenic features (terraces and canals) that were subject to Inka imperial reign. The highland valley was in the southwest area of the Inka Empire, known as Condesuyos, one of the four regions of Tawantinsuyu. Spanish colonial and Andean historical accounts describe how the Inka intensified local settlements and constructed new sites in the region, resettling populations to labor in administrative and ceremonial sites dedicated to sacred regional volcanoes and mountains (wak'a) (Albornoz 1989 [1582]; Cieza de León 1967 [1553]; Guaman Poma 1980 [1613]). The Valley of Volcanoes presented a novel landscape to the Inka with the volcanic landscape of the Southern Peruvian Andes distinct from the Cuzco region. The tensions of empire and colonial encounters are manifest in social memories and the material landscape. An oral history recounts a battle waged by regional volcanoes against the interloping Inka and an ushnu (ceremonial platform) was built under Inka auspices that articulates with the contemporaneous volcanic lava flows of Ninamama (Mother-Fire). Archaeological evidence, (ethno)historic and ethnographic sources illustrate how Inka imperial expansion (AD1400–1532) sought to incorporate the local landscape, expand settlements and intensify infrastructure in the valley.

Mendelsohn, Rebecca (Metropolitan Museum of Art) and José Luis Macías (Instituto de Geofísica, UNAM)
[157]

Volcanic Hazards and Human Resilience: A View from Izapa, Chiapas, Mexico

This paper introduces the topics of volcanic hazards and human resilience, raising key questions for discussion and highlighting the significance of several landmark studies. We also present preliminary results of ongoing research at the archaeological site of Izapa, Chiapas, Mexico, a coastal settlement occupied for nearly 3,000 years, from ca. 1900 BC–AD 1100. It has long been known that this coastal capital was constructed to align with the summit of the Tacaná volcano. Yet despite the dominating presence of volcanoes on the local landscape, the impact of volcanic activity on the inhabitants of Izapa is not often discussed. Recently, Macías and his colleagues have documented a large-scale eruption of Tacaná sometime between 30 BC and AD 80, which may have contributed to social unrest at the site. Further comparison between the Tacaná eruptive sequence and settlement pattern data reveal that this event may have been one of several eruptions that impacted life for Izapeños. We discuss the current geological and archaeological evidence for volcanic eruptions and human resilience at Izapa and speculate on why residents may have chosen to continue inhabiting the site despite continued risk of volcanic hazards.

[157]

Chair

Mendoza, Rubén (CSU Monterey Bay)
[225]

Discussant

Meng, Fanxiu
[66]

Paleoindian Use of the North Bank at the Blackwater Draw Site: Debitage and Stone Tool Patterns

Blackwater Draw Locality No.1, the Clovis type site located in eastern New Mexico, is one of the most important Paleoindian kill and camp sites in North America. Several episodes of archaeological investigations have occurred at the site, but analyses of cultural materials and dissemination of results remain in varied stages of completion. For example, the systematic analysis of lithic artifacts recovered from excavations at the site's "north bank" are still lacking. The goal of this project is to explore Paleoindian behavior by examining patterns in lithic tools and debitage from a theoretical perspective of technological organization and risk management. Discussion will address results in light of similar analyses conducted on materials recovered from the south bank to better understand variability in Paleoindian behavior through time, as well as across space at Blackwater Draw, New Mexico.

Meng, Fanxiu [77] see Smith, Heather

Meng, Qi
[35]

The Development of Regional Imbalance in Prehistoric Xinjiang: Indication of the Burial Records

The archaeological record of prehistoric Xinjiang is integral to our understanding of Eurasian prehistory, although this vast territory is

usually treated as a single culturally homogeneous area. The distinctive characteristics of different geo-cultural units within it are not given enough attention in most studies. Archaeological discoveries (mainly of burials) made during the last two decades illustrate the substantial regional variability in cultural and social development to be seen within prehistoric Xinjiang. The eastern portion is characterized by continuity, whereas the western part displays discontinuity to a large degree. Hierarchical societies seem to develop much earlier in the northern part compared to elsewhere in Xinjiang. Additionally, external influences from adjacent areas, namely, Gansu and Qinghai in China, Western Central Asia, Southern Siberia and Mongolia, play important roles in shaping these regional differences.

Mennenga, Moritz [238] see Segschneider, Martin
Mennenga, Moritz [107] see Wolters, Steffen

Menzer, Jeremy [175] see Franklin, Jay

Merchant, Joe [249] see Fleisher, Jeffrey

Mercier, Simon [189] see Costa, Philippe

Merkle, Ann (Washington University in St. Louis) and Michael Frachetti (Washington University, St. Louis)
[261]

Innovative Traditions: Material Culture and Identity in the Highlands of Medieval Central Asia

How does the occupation of an urban site in a semi-remote part of the medieval Central Asian landscape affect concepts of identity and community? This presentation will discuss recent archaeological research from the highland medieval site of Tashbulak, Uzbekistan. Located in the foothills of the Zerafshan Mountains, Tashbulak shows evidence of heavily insular pottery production concurrent with rich interaction through trade with lowland metropolises such as Samarkand, Chach and Akhsiket. The pottery, trade goods, and other archaeological evidence from the site all suggest that Tashbulak was a liminal site of syncretism, cultural preservation, and innovation, which presents new possibilities in how we define cities, identity, and religion.

[261]

Chair

Merkle, Ann [48] see Frachetti, Michael

Merod, Zoe [56] see Mills, Rebekah

Mersmann, Joy and John Stauffer (Washington University, St. Louis)

[166]

North American "Chac and Roll": Material Correlates of Thunder God Symbolism in American Bottom Archaeology

North American and Mesoamerican material cultures exhibit similarities that were seen by early diffusionists as evidence for northward migrations that catalyzed social complexity among Mississippian period (AD 1050–1500) cultures. Iconographically, assemblages from both geographic areas highlight thunder deities wielding celtiform objects as symbols of politico-religious offices, but Mississippian examples frequently include "striped pole" motifs that resemble historic and archaeological features in the middle of community spaces. These iconographic subjects reveal that arrangements of central pole features in relation to the mounds and plazas of North American sites require greater attention. In this study, we examine the arrangement of Emergent Mississippian (AD 850–1050) and Mississippian period central pole features at the Cahokia site over time to identify shifts in community spaces and interpret the distribution of authority among their inhabitants, using viewsheds modeled in a geographic information system. We hypothesize a shift occurring circa 1150 AD, and run a viewshed analysis on both a modern DEM and on a recreation of a pre-1150 DEM. Using this data, we address the changing structure of politico-religious authority at Cahokia as mediated through highly visible center poles.

Mertan, Tamer [83] see Ugras, Funda

Mesia-Montenegro, Christian (Universidad Científica del Sur)

[182]

Secularism and Religiousness in Late Formative Ceramics from Chavín de Huántar

The pottery from the ceremonial center of Chavín de Huántar has been the reason for considerable attention by numerous researchers who have highlighted various qualities related to its manufacturing and iconography. Special attention has been put in ceramics qualified as ceremonial, from closed contexts (Ofrendas Gallery) inside the ceremonial center and from pottery with icons related to supernatural beings (sensu Rowe 1962). At the same time, in the last decades has been identified a ceramic ensemble recently recognized as janabarroide, which within its various attributes presents a series of patterned designs whose Basic units have "S", "U" and "O" shapes. This type of pottery appears in Chavín de Huántar in contexts outside the monumental nucleus (Campo Oeste, Wacheqsa, la Banda, etc), while ceremonial ceramics with abundant anthropomorphic designs are found overwhelmingly in the nuclear area of the Ceremonial Center. In that sense the this paper argues the existence of an intrinsic and

controlled segregation context of the use of ceramics according to the meanings and / or nature of the purposes for which they were produced, sometimes allowing the occasional coexistence of both sets.

Messal, Sebastian [107] see Lueth, Friedrich
Messal, Sebastian [107] see Ruby, Bret

Messenger, Olivia [167] see Wilson, Jeremy

Messinger, Emma, John Walden (University of Pittsburgh), Michael Biggie (Los Angeles Maritime Institute), Victoria Izzo (Texas A&M University) and Kirsten Green (University of Montana)

[178]

Examining Intermediate Elite Ancestor Veneration and Neighborhood Identity Formation through Mortuary Practices at Lower Dover, Belize

Changes in burial practices and the construction of mortuary shrines can reflect key shifts in community identity over time. The comparison of mortuary traditions between three minor centers in the Lower Dover polity reveals public and ideological affinities, and allows us to create a chronology of power dynamics to investigate how the rise of a major polity impacted the political and ceremonial landscape. The Late Classic growth of the Lower Dover polity sees corresponding transitions in the strategies of surrounding intermediate elites at the minor centers of Tutu Uitz Na, Floral Park, and Barton Ramie. This presentation documents changes in shrine architecture, artifact assemblages, and mortuary customs at each of these three intermediate elite centers to detect trends in identity formation, and gauge the reception to the rise of Lower Dover. Examining mortuary trends in each of these respective neighborhoods illustrates whether intermediate elites were employing ceremonial strategies of compliance or conflict with the ascendant apical elite at Lower Dover. The emphasis on ancestor veneration at points of political conflict may be a means to amplify lineage and neighborhood-level identities in contrast with incoming political narratives from the emergent polity.

Metcalfe, Duncan [245] see Boomgarden, Shannon

Metcalfe, Megan [238] see Evans, Amanda

Metz, Micca (Environmental Science Associates)

[167]

The Beauty behind How Our Families Loved Us: An Analysis of the Decorative Coffin Hardware of Subadults in Bethel Cemetery, Indianapolis, IN

In the eighteenth and nineteenth centuries, a cultural phenomenon began to develop in America where death became romanticized. This cultural shift can be observed today in the preservation of mass-produced coffin hardware found in the graves of both children and adults from all socioeconomic backgrounds. Decorative coffins from this era set the cultural mood of a nation as its people coped with their own mortality. This has been referred to as the "beautification of death movement" and it sought to idealize death and maintain a sense of connection between the living and their deceased. These pieces of coffin hardware played a part in preserving the identity of the deceased. Plaques that read "Mother," "Father," or "Our Babe" in etched calligraphy suggest that in life as in death the occupant of such a coffin was a member of society, possessing a specific identity. For the children, buried before their identities have solidified, their loss to their family was still romanticized within their decorative burials. The coffin hardware recovered from the graves of children in Bethel Cemetery in Indianapolis, Indiana supports this notion of the beautification of death and the preservation of identity.

Meyer, Brett

[76]

An Assessment of Late Prehistoric Shellfish Exploitations in Western Wisconsin

An analysis of 800 freshwater mussel shells representing 28 species from an Oneota shell midden at the State Road Coulee site (47LC176) in La Crosse County, Wisconsin, represents the largest midden assemblage recovered from any of the many local Oneota sites. Mussel assemblages from Oneota Tradition agriculturalists (ca. 800–500 BP) are typically recovered from pit features and consist of species from varied habitats due to their dual use as a food source and as temper for pottery. The State Road sample is examined for variation in habitat exploitation and is also compared to a recent synthesis of regional mussel exploitation.

Meyer, Jana (University of Bonn, University of New Mexico)

[148]

The Spatial Distribution of Jewelry at Tijeras Pueblo: A GIS-Based Study Using Hot Spot Analysis

Jewelry can serve as an indicator of wealth and as markers of cultural identity on several social levels. An unequal distribution of jewelry may be culturally significant and archaeologically informative on the social structure of a site. Using geographic information systems (GIS), I analyze the spatial distribution of jewelry within Tijeras Pueblo via optimized hot spot analysis. Data are drawn from publications resulting from the 1970s excavations. This study addresses two interconnected research goals: first, to assess the nature of the spatial distribution of jewelry within the site: is jewelry distributed equally or unequally? Second, to test whether the observed distribution provides evidence for unequal access to prestige and wealth, or alternatively, for the presence of jewelry craft production within the site. Results show an unequal distribution of jewelry with a statistically significant hot spot in the northwest

portion of the main occupation mound. Based on the otherwise dispersed distribution of jewelry from rare materials and of jewelry blanks and raw materials, this hot spot is likely related to ritual activities associated with a kiva that is located in the same area, rather than indicating unequal access to wealth or jewelry workshops.

Meyer, Kelton (Colorado State University)

[68]

Tangible Data from Text: 3D Reconstruction of Smithsonian Excavations in Trench E at the Lindenmeier Folsom Site, Northern Colorado

The Lindenmeier site is a well-known multi-cluster distribution of Folsom cultural deposits in northern Colorado, and it represents either repeated occupation events, a single large aggregation episode, or possibly a combination of aggregated palimpsests. At least nine clusters of artifacts/faunal remains are known, spread across an area of more than 800 linear m and encompassing nearly 2,000 m² of excavations. The horizontal distribution of materials is generally well-understood from Frank Roberts' excavations with the Smithsonian Institution in Areas I and II on the western side of the site, and prior refit analysis of lithics suggests some degree of contemporaneity within these two areas. Lesser known is the source of variation in the vertical dispersal of cultural materials present in site backplots, either through geological reworking and bioturbation or perhaps from reoccupation by Folsom groups or later occupants. This paper critically assesses the utility of 3D provenience information for individually mapped specimens, recorded in detail by Roberts' crew between 1938 and 1940, as one means of addressing the reoccupation/aggregation issue at Lindenmeier. Interpretations for a 3D cluster analysis of chipped stone and faunal remains are presented for Trench E, a presently unpublished Smithsonian excavation from 1938.

[68]

Chair

Meyer, Lauren [186] see van Leeuwen, Willem

Meyer Garza, Fabiola and William Pratt (University of Texas, Austin)

[201]

Not in the Litter: An Analysis of a Late Integration Midden Deposit at Cochasquí

Little ceramic analysis has been conducted at Cochasquí since the 1990s, and none has been done on the assemblage collected at the largest pyramid at the site, Pyramid G. A small portion of Pyramid G was excavated in 2018 and 2019, revealing a previous pyramid surface lined with a cangahua wall as well as a zone apparently representing an intact midden abutting the wall which appears to have been swept or washed off the buried pyramid surface. This carbon-rich zone full of burned bone, ceramic sherds, and shell fragments may be the only intact midden associated with pyramid use ever found at Cochasquí. As such, this deposit has the potential to reveal not only the date of this previous occupation of the pyramid, but also yield clues to the much-debated function of the pyramid. This paper reviews the implications of a midden being found inside of a pyramid, presents a brief interpretation of the different vessel types that were found, and analyzes the ceramic fragments from this apparent midden, comparing them to ceramics recovered from intact pyramid fill in order to test whether this zone truly represents an intact midden deposit.

Meyers, Allan [197] see Kolega, Matija

Meyers, Maureen (University of Mississippi) and Amber VanDerwarker (University of California, Santa Barbara)

[1]

Regional Contexts of Sexual Harassment in the United States: A Comparison of the SEAC and SCA Surveys

Sexual harassment has long been rampant in the discipline of archaeology, and until recently, our collective understanding of its pervasiveness and effects has been largely anecdotal. Recent surveys on the topic aimed at the memberships of the Southeastern Archaeological Conference (Meyers et al. 2018) and the Society for California Archaeology (Radde 2018; VanDerwarker et al. 2018) are beginning to provide the data necessary to understand the rates and contexts of harassment in American settings. Interestingly, while both surveys report high rates of harassment, the rate reported by SEAC members is nearly 20% greater than that reported in the SCA survey (68% vs. 50%). This large discrepancy, along with significant demographic differences between the two samples, reveals the need for a geographically broader survey implemented by the SAA to account for differential factors leading to this divergence. Our presentation explores this discrepancy with the goal of discovering which variable(s) associate with the lower vs. higher harassment rates in these two broad regions—an exercise which may allow us to pinpoint specific changes that could be implemented in different contexts to reduce this seriously problematic behavior.

[1]

Chair

Meyers, Maureen (University of Mississippi)

[87]

Discussant

Meyers, Maureen [123] see Cordell, Ann

Meyers, Stephen [63] see Tankersley, Kenneth

Meza Rodriguez, Carolina [150] see Jurado, Erik

Michael, Amy (University of New Hampshire)

[153]

Moderator

[153]

Discussant

Michael, Amy [240] see Blatt, Samantha

Michael, Amy [212] see Dubois, Katherine

Michael, Amy [184] see Friese, Crystina

Michael, Amy [270] see Peterson, Kateea

Michelet, Dominique (CNRS/Université de PARIS 1)

[20]

About the Art and Energetic Costs of Stone Making in the Maya Puuc Region

During the span of about two centuries (AD 760–960) Maya builders reached one of the pinnacles of the art of construction in this area of the northwestern Yucatán Peninsula. Designed initially to estimate the relative construction costs of three types of residential structures (with perishable materials only or with non-vaulted and vaulted masonry), an experimental program was carried out in the mid-1990s in the western Puuc region with the participation of the French limestone-cutting specialist, Jean-Claude Bessac. Based on a study of the stigmata left behind by the making of exposed stones across various buildings, the program included the replication of different types of specialized stones using only lithic tools: simple external veneer stones, veneer stones with mosaic decoration and with glyphs, interior veneer stones, vaulted stones, cornices . . . Although preliminary, this study provided several interesting results that will be presented in this paper.

Micheletti, George (University of Central Florida) and Terry Powis (Kennesaw State University)

[130]

Spatial Analysis of Hinterland Settlement at the Ancient Maya Site of Pacbitun, Belize

The 2019 periphery investigation at the prehispanic Maya center of Pacbitun, Belize successfully ground-truthed, mapped, and tested hinterland settlement hierarchically classified as minor centers and high-status commoner residences—each identified and categorized using lidar data prior to the field season. Interestingly, analysis of ceramics collected from plaza excavations and looted buildings suggests that the initial phase of construction for each group date to the Late Classic period (AD 550–800). While a Late Classic construction origin for the largest and most complex periphery groups at a site that was founded a millennium and a half earlier during the Middle Preclassic period (ca. 900 BC) was not expected, the dating aligns well with prior settlement research at Pacbitun which indicates a dramatic rise in the periphery population. These constructions also coincide with Late Classic sociopolitical turmoil evinced in the physical and functional alterations to site core architecture. I believe physical and spatial attributes of Pacbitun's periphery groups reflect these changes and support their Late Classic construction. This presentation will examine spatial attributes associated with group configuration, location, orientation, and complexity which emulates the alterations to socio-ritual practices of the royal elite and possibly demonstrates defensive strategies during a time of political instability.

Micheletti, George (University of Central Florida)

[155]

Discussant

Micheletti, George [197] see Skaggs, Sheldon

Michigan State University, [185] see Quates, E. W. Duane

Micon, Jonathan (University of Georgia)

[63]

Status, Signaling, and St. Lawrence Iroquoian Incorporation

This study employs regional demographic profiles and ethnohistoric literature as interpretive tools to argue that the social context in which St. Lawrence Iroquoians (SLI) were brought into emerging Haudenosaunee and Huron-Wendat communities affected the ways in which they signaled previous identities in their new social environments. During the sixteenth century AD, peoples identified broadly as SLI relocated among villages belonging to the nascent Huron-Wendat and Haudenosaunee confederacies. It is often argued that the incorporation of SLI into Haudenosaunee communities involved the adoption of captives whereas the incorporation of SLI into Huron-Wendat communities involved the sheltering of refugees. In the case of individual captivity, it is expected that SLI newcomers would be less likely to publicly signal prior identities than in a scenario where large groups of SLI were incorporated on equal terms. High-value materials are more likely to convey social messages and reflect changes—or not—in status, ideology, and displayed identities. This study tests this hypothesis by examining the frequency and regional distribution of SLI-associated high-value materials on sites located in southern Ontario and central New York State dating to circa AD 1450–1600.

Middleton, Arthur [75] see Todd, Lawrence

Middleton, Sherri [148] see Portman, Katherine

Mierswa, Emily (Simon Fraser University)

[202]

The Ethos of Less Invasive Archaeological Methods: Case Studies from the Northeastern United States

If ethical archaeological field practice is one that maximizes information while seeking to minimize site disturbance, then minimally and noninvasive methods should be applicable to a wide range of archaeological contexts. While minimally invasive methods have been a part of archaeological inquiry since the mid-1980's there has been no systematic exploration of why and when archaeologists choose these methods. Before archaeologists can fully embrace these methods as standard practice, we need to reflect and ask, "what is the relative value of these practices?". This research constitutes a first step in this discourse by considering what scientific and ideological considerations go into the choice to use minimally and noninvasive methods with case studies drawn from the Northeastern United States. Understanding the context of less invasive methods in the field provides key background for archaeologists as the discipline shifts and grows with new technology, methods, and ethical considerations into the 2020s.

Mietes, Esther [100] see Napolitano, Matthew

Mikeska, Christine (University of North Carolina, Chapel Hill)

[22]

Understanding Patterns of Indigenous White-Tailed Deer (Odocoileus virginianus) Exploitation in the North Carolina Piedmont Using Strontium (87Sr/86Sr) Isotope Analysis

The varied responses by Native communities within the American Southeast to European colonization resulted in a period of dynamic social, economic, and political change. One such response to the colonial encounter was the development of a robust trade in the skins of white-tailed deer. In this paper, I focus on the effects of the deerskin trade on the deer exploitation practices of Native communities within the North Carolina Piedmont using strontium isotope analysis (87Sr/86Sr), identifying patterns of mobility and estimating hunting territories. Through the analysis of archaeofaunal assemblages from five Piedmont sites dating from AD 1450 to 1710 in the Eno and Dan River drainages, I identify multiple patterns of change in Indigenous hunting behaviors. Situating these contrasting patterns of exploitation within the broader context of European colonization and the deerskin trade, these results highlight the dynamic and community-specific responses of Native communities to the disruptions and opportunities represented by the colonial encounter.

Miklashevich, Elena [25] see Mattioli, Tommaso

Milbrath, Susan (Florida Museum of Natural History)

[225]

Take My Heart, Take My Head: Death among Gods in the Codex Borgia

Ritual violence is well represented in the Codex Borgia, a masterpiece from early sixteenth century Central Mexico. Narrative scenes depict Venus gods alongside deities honored during seasonal veintena festivals known from the Valley of Mexico and Tlaxcala. The Aztec Tlacaxipehualiztli festival featured sacrifice of Xipe Totec's impersonators during March. In the Codex Borgia, the god himself is represented as the victim stretched out on a round stone. Venus gods appear alongside, indicating the planet plays an important role. The 18-page narrative references specific veintena festivals to provide a chronological framework for events involving the changing Venus phases. Another page in the narrative represents Quecholli, a November festival honoring Camaxtli. Here we see this hunting god on a tzompantli, evoking a decapitation ritual described in the Aztec festival of Quecholli, when severed heads were placed on Mixcoatl-Camaxtli's skull rack. The Codex Borgia shows Camaxtli merged with the skeletal "lord of dawn" at a time when Venus was transiting the underworld during Quecholli. Alongside, Quetzalcoatl extracts Tlahuizcalpantecuhtli's heart, meaning one Venus god kills the other, representing a transition in Venus phases. Then below we see Tlahuizcalpantecuhtli's decapitation, symbolizing the final underworld transformation of Venus, just prior to the Evening Star's reappearance.

Miles, Aimee [100] see Levin, Maureece

Millaire, Jean-François [243] see Hyland, Corrie

Millard, Andrew [199] see Adams, Alisha

Miller, Bryan (University of Michigan)

[62]

Imperial Impact: Population Dynamics and Social Landscapes of Inner Asia under the First Steppe Empire

This paper integrates survey, mortuary and genetic research into a multidisciplinary and multiscale consideration of the impact that large political regimes (i.e., empires) have on the social landscapes of individual communities and whole regions. In the case of the first steppe empire of Inner Asia (the Xiongnu), while material accoutrements of political culture became increasingly homogenous across vast areas of the steppe, constituents of local communities often shifted, resulting in highly intermixed local populations, and

individual locales were reorganized into new regional hierarchies that fed into the supra-regional polity.

Miller, Christopher [6] see Gonzalez, Juan
Miller, Christopher [11] see Matos, Daniela

Miller, D. Shane (Mississippi State University), James Strawn (University of Georgia), Derek Anderson (Mississippi State University) and Kara Larson (Mississippi State University)

[180]

Renewed Investigations at the Hester (22MO569) and Beachum-Harrison (22MO1011) Sites in Amory, Mississippi

In 2017–2019, a 35 m² block excavation, four test units, sixteen bucket auger tests, and 37 shovel tests were excavated at the Hester site (22MO569) and Beachum-Harrison (22MO1011) sites to investigate the spatial boundaries and geoarchaeological context of the site. Analyses of artifacts and sediments recovered from a 3 × 2 m locus during the 2017 excavations at the Hester site suggest that the site contains Late Pleistocene and Early Holocene deposits that are stratified and near primary context. In this paper, we discuss the results of the analyses conducted following the 2017 field season, which includes three new radiocarbon dates from the Hester site, and survey and testing at the Beachum-Harrison site.

Miller, Ian (University of Oklahoma), Thomas Fenn (University of Oklahoma) and Glenys McGowan (University of Queensland)

[234]

Ancient Economics in West Africa: A Study of Copper Production and Trade at Marandet, Niger

Copper metals, in high demand in ancient sub-Saharan Africa, were used as a medium of exchange, a material resource, and as wearable adornments. Extensive remains of metal production found at Marandet, Niger, show that it played a key role in ancient Trans-Saharan economies. Different copper alloys passed through and were produced at Marandet, and were disseminated along local, regional and long-distance West African trade networks during the first and second Millennia AD. Likewise, different goods, technologies, and ideas were exchanged through these networks across the Sahara and within sub-Saharan Africa. This paper presents new scientific research on ceramic crucibles and metal samples from Marandet employing electron microprobe analysis (EMPA) and 3D photogrammetry to explore anthropological and humanistic questions about past West African societies. Chemical and microstructural data derived from EMPA provide a better understanding of technologies used and materials produced connected to Trans-Saharan trade and commerce. 3D photogrammetry of the crucibles allows for reconstructing technological aspects and variability of their production and use, while also providing new high-resolution documentation. Results of this research provides new and insightful information about the role of Marandet in producing and traded these metals, and the structure and interaction of ancient economies in the region.

Miller, Jennifer [38] see Radican, Kelsey

Miller, Kevin and Steve Carpenter (SWCA Environmental Consultants)

[194]

Excavation and Innovation at the Llano Terrace Site (41MS78), Mason County, Texas

The Llano Terrace site (41MS78) is a prehistoric campsite on the western terraces of the Llano River in Mason County, Texas. Bisected by Ranch-to-Market (RM) 1871, the site is composed of stratified cultural components in deep alluvial sediments exposed in roadcuts along both sides of the existing roadway. Cultural materials, mainly chipped stone tools and earth ovens composed of fire-cracked local limestone, span the Early to Late Archaic (8800–2000 BP). Excavations targeted a Middle Archaic Calf Creek component (circa 5300 BP), one of the more prominent components on this and nearby sites. The site contributes data to explore the regional expression of a complex that extends from Texas to Missouri. Data recovery excavations posed several logistical and interpretative challenges, including excavating on a steep slope over an active roadway, assessing past site damage from roadway maintenance, collating geomorphological and cultural components across both sides of the wide RM 1871 roadway, and determining chronology with a variety of tactics. The work utilized traditional excavation methodology combined with innovative technologies (drones, optically stimulated luminescence dating, Structure from Motion photogrammetry) to comprehensively explore the site. This paper discusses the preliminary results of these investigations and how the various challenges were successfully met.

Miller, Kye (PaleoWest Archaeology) and Jeremy Loven (PaleoWest Archaeology)

[193]

Curiosity and Collaboration: Interaction with the Tribal Public in Northwestern New Mexico

Between 2011 and 2019, PaleoWest Archaeology assisted the Bureau of Reclamation with the nation's largest federally-funded archaeology project, the Navajo-Gallup Water Supply Project (NGWSP) in northwest New Mexico. A substantial portion of the project is on Navajo Nation tribal lands and the archaeological work conducted ahead of this water infrastructure project was of great interest to local Navajo people and other descendant and consulting tribes. This presentation summarizes our experience with the tribal public as part of NGWSP.

Miller, Mary

[265]

Visualizing Battle: What We Can Still Learn from Bonampak

Fire was instrumental to Maya life. They needed firewood for cooking and to burn the limestone that would allow for plain dry maize

to become nutritious nixtamal. And they used fire as a weapon of war. In the Bonampak murals, in a badly eroded scene, a warrior leaps atop a temple to set it afire. Long thought to be a characteristic representation of Central Mexican warfare—whether rendered at Chichen Itza or in Colonial manuscripts—this practice of burning the sacred architecture in the course of battle itself can be demonstrated to be present among the Classic Maya. In fact, the practices of Mesoamerican warfare, from the taking of captives to death on the battlefield to the burned, scorched destruction of city architecture, can be shown as present among the eighth-century Maya.

Miller, Mason

[147]

A Presentation and Interpretation of YouTube Livestream Viewing Analytics from a Central Texas Excavation Project Public Outreach

From mid October 2018 to early April 2019, archaeologists from AmaTerra Environmental, Inc., Texas State University and the Center for Archaeological Research at the University of Texas at San Antonio conducted data recovery excavations at the Headwaters Site (41CM204), in New Braunfels, Texas. Along with intensive excavations (proposed for presentation by others), the project included a substantial public engagement component that included weekly livestreams on YouTube from the excavation site. The videos, hosted by the archaeologists themselves and primarily developed by the author, provided live excavation updates, question/answer sessions, and an in-depth explanation of a fundamental aspect of archaeological research (e.g., dating techniques, measuring instruments, geoarchaeology). To date, the team has developed 14 live updates and two post-field recorded updates that are still accessible on YouTube that have amassed nearly 3,000 views and more than 254 hours of viewing time (accessible at <https://bit.ly/2m5vVDT>). This poster will summarize the Live Stream component and present interpretations from videos' viewing analytics provided by YouTube to identify topics of interest, viewer retention patterns, and more. Finally, the poster will provide [sometimes hard-earned] tips and suggestions that the author has learned through developing the outreach.

Miller, Mason [194] see Parker, Adam

Miller, Mel (University of Tulsa)

[162]

Artifact Condition, Site Formation, and Artifact Utilization at the Fauresmith Site of Bestwood, South Africa

The Fauresmith site of Bestwood, Northern Cape, South Africa is a large lithic accumulation and a transitional lithic industry site. In order to gain insight into site formation and artifact utilization at this and other lithic accumulation and transitional sites, we documented artifact condition and identified microwear traces of artifact use. Raw material samples of banded ironstone were collected from the Kuruman Hills and used in a series of postdepositional and functional experiments. To assess postdepositional damage, an artifact condition ranking system was developed based on ridge width changes documented during tumbling experiments. In addition, use-wear experiments were conducted for several tasks, including butchery, woodworking, and hide working. The resulting edge damage and ridge width patterns on the experimental tools are compared to Bestwood artifacts excavated from two areas of the site, allowing us to infer artifact condition and artifact utilization across the site. The results of this research have implications for the formation of large lithic accumulation sites, the development and utilization of transitional lithic industries, and niche construction and human impact on the environment in deep time.

Miller, Melanie (University of Otago, Dunedin, New Zealand), Iain Kendall (University of Bristol, England), Richard Evershed (University of Bristol, England) and Christine Hastorf (University of California, Berkeley)

[61]

Protein from the Land, Not the Lake: New Interpretations of Human Dietary Patterns for Inhabitants of Southern Lake Titicaca, Bolivia, Using Bulk and Compound-Specific Amino Acid Stable Isotope Data (1500 BC–AD 1100)

Decades of archaeological research on the Taraco Peninsula (Lake Titicaca, Bolivia) have provided detailed datasets indicating dynamic subsistence practices including farming, herding, and fishing. Stable isotope analysis of human skeletal tissues has focused on bulk isotope data (primarily bone collagen C and N isotope data) to track general dietary habits. Compound-specific amino acid stable isotope analysis provides a further level of detail, allowing identification of foods from freshwater, marine, and terrestrial environments. Our research combines these isotopic methods to study the diets of people living on the Taraco Peninsula from 1500 BC to AD 1100. Earlier research identified an isotopic overlap between maize, a C₄-plant, and fish from Lake Titicaca. Using a multi-isotope approach, we analysed teeth (enamel and dentin) for bulk carbon and nitrogen isotope data and compound-specific amino acid carbon isotope data. The $\delta^{13}\text{C}$ values of Taraco Peninsula peoples rise over time, driven by increased consumption of maize, not lake fish. Additionally, terrestrial protein sources, such as quinoa, were the primary dietary protein sources, with less consumption of terrestrial meats and lake fish than anticipated. This research demonstrates the importance of using multiple isotope datasets to reach more nuanced understandings of dietary practices in human history.

Miller, Myles (Versar)

[135]

Using Multiple Methods to Examine Multiple Radiocarbon Chronologies: An Example from the U.S. Southwest

Analysis of over 4,000 radiocarbon age estimates reveals changing frequencies in architectural forms, technologies, and settlement patterns spanning the period of 3500–400 BP in the Jornada region of the American Southwest. Analysis of multiple summed probability distributions reveals several distinctive trends throughout the terminal Middle Holocene and Late Holocene and corresponding Middle Archaic, Late Archaic, and Ceramic cultural periods, revealing punctuated demographic swings and regional abandonments, technological and subsistence developments, and the appearance of new ideologies and their associated iconographic expressions. The use of summed probability distributions provides a first order approximation of chronological trends and means of comparing trends among multiple dated phenomena. However, it is difficult to isolate the boundaries, or beginning

and ending dates, of the patterns. This lack of precision in bounding temporal periods hinders comparisons of the cultural sequences with high resolution paleoenvironmental data and high resolution (tree-ring dated) cultural sequences in adjacent regions. Bayesian modeling and kernel density estimation are two methods that offer a means of resolving this problem, allowing for the temporal boundaries of certain trends to be isolated and refined. A comparison of phase boundaries determined through Bayesian modeling and kernel density estimation is presented for multiple phenomena.

Miller, Myles [136] see Graves, Timothy

Miller, Naomi (Univ of Pennsylvania Museum & ISAW)

[124]

Discussant

Miller, Sarah

[87]

Moderator

Miller, Sarah, Sara Ayers-Rigsby (Florida Public Archaeology Network), Karen Walker (Florida Museum of Natural History), Rachael Kangas (Florida Public Archaeology Network) and Michelle LeFebvre (Florida Museum of Natural History)

[146]

Resiliency and Adaptation Challenges Ahead for Florida's Heritage Monitoring Scouts

Climate change is having an immediate and devastating effect on archaeological sites in Florida. The Florida Public Archaeology Network's Heritage Monitoring Scouts (HMS Florida) program empowers local communities to document the impacts of climate change at various sites throughout the state. While archaeology reveals how people have lived in coastal areas through weather events and past fluctuations in climate, the scale of modern climate change can be overwhelming. Our ability to document sites can show humanity's resilience to these fluctuations while also making it clear that adaptation and mitigation of coastal areas must be paramount. This paper will explore two case studies from coastal Florida that have served as visceral points of focus for local communities to see the impacts of climate change. At Shell Bluff Landing in the northeast part of the state a site stewardship program was developed to closely document changes in time over the last year with alarming results. In the opposite corner of the state at Calusa Island, a private land trust was created to protect local natural environments from the impacts of development. The Calusa Land Trust has subsequently seen massive loss due to erosion.

Miller, Virginia (University of Illinois at Chicago)

[141]

The Disembodied Eye in Maya Art and Ritual Practice

The ritual use and display of skulls, digits, and femurs is well documented for the Maya and other Mesoamerican groups. But except for the heart, few sources describe how organs and soft body tissues were curated during the brief time they could have been viable for manipulation or display. Nevertheless, there is rich corpus of Mesoamerican art demonstrating that such exhibitions must have taken place. Extruded eyeballs, often with the optic nerve still attached, form part of the iconographic complex associated with death, although rarely on a monumental scale during the Classic period. During the Terminal Classic and later, however, images of human sacrifice and its aftermath become more prominent and public. In the northern Maya lowlands, pendant and detached eyeballs are among the motifs represented, sometimes as adornments for humans and non-humans. Furthermore, crania from the Sacred Cenote of Chichen Itza show evidence of eyeball extraction, suggesting that eyeballs were removed, presumably from sacrificial victims, and manipulated postmortem. The active power of sight is demonstrated by the Classic-era practice of mutilating the face, and especially the eyes, of rulers represented in sculpture and paintings. Did the ancient Maya also take out and display the eyes of the defeated?

Miller, Virginia [225] see Tiesler, Vera

Mills, Barbara (University of Arizona)

[29]

Discussant

Mills, Barbara (University of Arizona) and Lynne Goldstein (Michigan State University)

[72]

The Demographics of Grants(man)ship: What We Know and What We Wished We Knew

As part of the SAA Task Force on Gender Disparities in Research Grant Submissions, we analyzed data from a number of sources to better understand gendered imbalances in archaeological grant applications. In this paper we first summarize our results, as reported in *American Antiquity* by Goldstein et al. (2018). We then reflect on some of the strengths and drawbacks in the data we collected during the process of conducting our research. Strengths included the cooperation of program officers, the availability of association-wide demographic data from the AAA, and the incorporation of extensive interviews with 36 female SAA members that provided qualitative data to complement quantitative trends. Drawbacks include the lack of recent and comprehensive SAA surveys, accessibility of certain forms of data from federal agencies (e.g., NEH and NSF), and a large enough interview sample to be able to look at how gender, other dimensions of diversity, and workplace setting intersect. We close with suggestions on how this study might be followed upon, and especially the need for continued research and monitoring of grant submissions and success.

Mills, Barbara [26] see Giomi, Evan

Mills, Barbara [160] see Knox, Corey
 Mills, Barbara [184] see Molinares, Stephen

Mills, Rebekah (SIPA, Columbia University), Rachel Brody (Boston College), Valerie Watson, Lauren Brooks (PaleoWest Archaeology) and Zoe Merod (Ithaca College)
[56]

Hidden Figures: The Women of Irish Archaeology

Last year among the top five hashtags in Ireland was #repealthe8th. On May 25, 2018, the amendment that largely banned all abortions was repealed. With this vote, many Irish women felt their voices were finally heard. With women's rights and activism at the forefront in Irish politics how has the role of women in Irish archaeology changed? Following a similar trajectory to women in American archaeology, those in Ireland faced similar plights. Until the building of the National Museum of Ireland in the late nineteenth century, the Royal Irish Academy (RIA) and the Royal Society of Antiquaries of Ireland (RSAI) held Ireland's archaeological and antiquarian collections. Today, these societies continue to be influential in defining Irish archaeology. Yet, it was not until 1949 that the first woman was admitted as a full member to the RIA. The RIA, today, writes that "the profession [of archaeology] is one of the most gender-equal professions in Europe," historically that has not been true. Who and where are women in Irish archaeology? We will explain how women have been active in archaeology well before they were officially invited and the many contributions they have and continue to make in Irish archaeology.

Milton, Emily (Michigan State University)
[67]

Testing the Water: Challenges of Developing an Isotopic Baseline for the Central Andes

The abrupt topography created by the Andes mountains along western South America creates a close-knit series of vertically diverse and sometimes harsh ecological zones. Evidence for early inter-zonal connections between multiple environments comes from Terminal Pleistocene sites at both the highlands and the coast in Southern Peru. While oxygen isotopes are commonly used for investigating trends in mobility and land use, complications remain for linking values with their local sources (Knudson 2009). This poster presents the results of oxygen isotope samples taken over 12 months. The water sampling survey transects extended from the coast to the highlands during wet and dry seasons. Preliminary results demonstrate the complexity of modern environmental conditions and the necessity for region-specific testing in propagating secure archaeological baselines. While these data demonstrate spatial and temporal patterns, further investigation is needed to show how modern environmental trends relate to those of the past.

Milton, Emily [180] see Rademaker, Kurt

Minc, Leah, Marcus Winter (INAH Oaxaca) and Cira Martínez López (INAH Oaxaca)
[39]

Intra-valley Exchange before the Rise of Monte Albán: New Data from Trace-element Analyses of Rosario Phase Ceramics

The Rosario phase (ca. 700–500 BCE) in the Valley of Oaxaca, Mexico, represents the period immediately preceding the rise of Monte Albán and predates processes of political centralization associated with the emergence of the Zapotec state. Relatively little is known about intra-valley interactions during this early time, beyond interpretations based on settlement pattern analyses. As part of our on-going INAA program to assess ceramic exchange in the valley, we here present provenance data on fragments of more than 1,000 ceramic vessels drawn from well-dated Rosario ($N = 849$) and Rosario/ MA Early I ($N = 154$) contexts from sites in all three arms of the valley. Comparisons of their chemical signatures with natural clays collected throughout the valley, as well as with wasters from known ceramic production sites, have allowed us to distinguish more than a dozen distinct ceramic-producing regions and to track the movement of different pottery wares within the valley. Our results indicate a much greater degree of exchange interaction than expected and have significant implications for understanding the economic and political geography of this key time period.

Minerbi, Joanne (California State University, Northridge) and Elisabeth Rareshide (University of California, Santa Barbara)
[254]

To Be a Scholar Is to Be Relevant: Sharing Knowledge with the Public

Academic learning and publishing can be insular in nature and use opaque language. We are groomed to communicate with peers and mentors. We are incentivized to publish content for an audience of similarly educated individuals. However, in the current anti-intellectual political and cultural environment, it is crucial that we communicate with the public. Moreover, we have a moral call to do so. Professional or academic status is neither an excuse nor a barrier to fulfilling this obligation. We present a case study in public outreach to the Fernandéño Tataviam Band of Mission Indians (Southern California). Our lithics educational workshop was initially offered to a family-oriented audience on two occasions. It was later presented as a professional, in-service seminar to the tribe's Native American cultural monitors. Through approachable language, an accessible format, demonstrations, and experiential learning, participants learned about the deep history of lithic technology, mechanics of working with stone, and the kinds of information that we can learn from this cultural material. We encourage our fellow archaeologists to creatively share what they have discovered with the public. Our project emphasizes the value of giving back to the community, especially to the very people whose cultural heritage we study.

Mink, Philip (University of Kentucky)
[255]

Let Them Eat Cheno-ams: Alan Sullivan and Beheading the King Corn Mythos in Grand Canyon Archaeology

Prior to Alan Sullivan's research Formative Period, Grand Canyon subsistence settlement models presumed prehistoric peoples settled in localities based on the proximity to areas most conducive to growing maize. These obligate models have been slowly revised by Sullivan and his student's research over the past 30 years. The excavation of Site 17 in the Upper Basin of Kaibab National Forest produced the first compelling evidence that corn might not actually be the "king" of subsistence prehistorically in the Grand Canyon. Instead research in the Upper Basin has suggested a subsistence strategy where prehistoric peoples actively engineered the landscape through fire and other techniques to encourage abundance in a variety of wild resources that could be exploited with little need for maize. These facultative models seem to fit the data recovered from the archaeological record better than the poorly substantiated ethnographic analogies. This paper will focus on my research that expands Sullivan's ideas beyond the Upper Basin to the Grand Canyon, as a whole.

[255]

Chair

Minkoff, Mary (James Madison's Montpelier)

[259]

A Cup, a Saucer, and Power: An Examination of the Relationship between Enslaved People and Overseer at James Madison's Montpelier

This paper will examine how archaeology can be used to ask and answer new questions about power dynamics at plantations across the American Mid-Atlantic and Southeast through the analysis of the materials at James Madison's Montpelier. Using fragments of matching teawares recovered archaeologically from both the enslaved field laborers' quarters and the nearby overseer's house as an entry point to this analysis, this paper will explore the complex relationships between the elite white plantation owners, the hired white overseers, and the enslaved African Americans. Using historical documents and archaeological remains it will explore the varying limitations on social and physical mobility, aspirational ideas, as well as access to material goods, specifically ceramics, between these three groups. By including the overseers in this discussion, a group that is often left out of the historical documents and modern historical and archaeological research, this paper strives to tell a more complete story of the plantation.

Minnis, Paul (University of Oklahoma)

[98]

Discussant

Miranda, Paula [143] see Scheinsohn, Vivian

Miron Marvan, Esteban

[221]

History and Archaeological Heritage and the Modern Maya

Modern Maya peoples have been denied of their right to appropriate their own history and archaeological heritage. After almost three decades of multiculturalism in Mexican laws and state rhetoric there is still a lot of colonial ideas, practices, and laws that prevent the participation of indigenous communities in the heritage discourses and their involvement in the management of archaeological heritage. This paper is about the current perceptions of history, archaeology and heritage among the Maya Ch'ol of northern Chiapas, who have articulated, without the help and despite the Mexican national state, a sense of history and time in their landscapes. The Ch'ol and the modern Maya peoples are interested to hear from the words written by the Classic Maya in languages related to what they talk now, and they have their own questions to ask the historical and archaeological record. They want the world to know that they walk next to us carrying the wisdom of their ancestors.

Miron Marvan, Esteban [197] see Campiani, Arianna

Misarti, Nicole [243] see Alfonso-Durruty, Marta

Mistretta, Brittany (University of Florida)

[22]

Nourishing Social Bonds: Tracing the Costly Signals of Caribbean Communal Rituals in Archaeofaunal Remains

Ceremonial centers from the precolumbian Caribbean are traditionally defined on the basis of exotic or elite ceramic and lithic artifacts and architectural features such as plazas and ball courts. Thus, rituals at these centers are confined solely to interactions between elite individuals who facilitated and managed ritual practices. However, increasing evidence in Caribbean archaeology suggests that groups likely gathered at designated ceremonial centers that served as neutral grounds for conducting public ritual exchanges to build and maintain alliances. Presented in this paper are preliminary results from a zooarchaeological analyses of faunal assemblages from MC-6, a Later Ceramic ceremonial center in the Turks and Caicos Islands. This research reexamines interpretations that confine rituals to elite activities through zooarchaeological analyses and within a human behavioral ecology framework to identify markers of costly signaling strategies as evidence of rituals that involved group interactions and communal cooperation as a means of community building. Costly signaling behaviors have been linked to communal rituals because they communicate a dedication to ritual participation and upholding group obligations. Incorporating communal activities into the spectrum of ritual practices provides a more complete understanding of the function of ceremonial centers in the social dynamics of precolumbian Caribbean societies.

[22]

Chair

Mitchell, Douglas, Laurene Montero (Pueblo Grande Museum), Mark Chenault (WestLand Resources Inc.) and Todd Bostwick (Verde Valley Archaeology Center)

[71]

Sixty Years of Unpublished Data from Pueblo Grande Museum: Analysis of Artifacts from the Platform Mound and Surrounding Areas

In the late 1980s, the Pueblo Grande Archival Project began with the goal of assembling and publishing the results of archaeological investigations conducted from 1929 through the 1980s. Pueblo Grande is one of the most important prehistoric Hohokam village sites in southern Arizona, containing a platform mound, ball court, and other public architecture. Three volumes of the Archival Series were published by the late 1990s providing details of the mound and history of the Museum. The artifact studies volume was begun in the mid-1990s, but languished. Over the last three years, a team of specialists analyzed selected artifacts and ecofacts collected from the Pueblo Grande Platform Mound and immediate vicinity to explore research themes pertaining to use of one of the few (and possibly largest) remaining intact platform mound complexes in the Phoenix Basin. Despite challenges with using legacy collections, these analyses of marine shell artifacts, ground stone, projectile points, pottery, wooden tools, faunal bone tools, ornaments, and food residue, suggest wide-ranging cultural interaction and exchange throughout the occupation of the site with an emphasis on specialized activities on the platform mound.

Mitchell, Mark [198] see Mandel, Rolfe

Mitchell, Spencer (University of California, Santa Barbara), Marisol Cortes-Rincon (Humboldt State University), Cady Rutherford (University at Texas, San Antonio), Jonathan Roldan (University of Nevada, Las Vegas) and Jeremy McFarland (Humboldt State University)

[53]

Ritual Deposits of N950: A Ritual Site in the Hinterlands of Dos Hombres, Belize

In this paper, we consider the ritual deposits found within the N950 site, which is located on the Dos Hombres to Gran Cacao Archaeology Project (DH2GC) in northwestern Belize. The site possesses a central shrine, seven monuments, a ball court and multiple subterranean features. All these features create a small-scale, yet complex ritual landscape in the hinterlands of Dos Hombres. Several of these features possess associated ritual deposits. By analyzing the excavation data, the spatial arrangements of the features through geospatial analysis and ethnographic accounts of modern-day Maya religious practices, we will present the potential purposes of these deposits. This would ultimately enable us to understand N950 within a regional social and economic context.

Mitchell, Spencer [230] see Cortes-Rincon, Marisol

Mitchell, Spencer [239] see Mailler, Mary

Mitchell, Spencer [178] see Rutherford, Cady

Mitrovica, Jerry [162] see Borreggine, Marisa

Mizoguchi, Koji (Kyushu University, Japan) and Junko Uchida (Institute of History and Philology, Academia Sinica)

[205]

A Lot More Than Burying the Dead: How Certain Mortuary Strategies Were Chosen at the Late Shang Kingly Mortuary Ceremonies

This paper will compare and correlate the events and/or trends of the Late Shang Kings, which have been 'recorded' in such classics as *Shiji* and the *Bamboo Chronicles* and recognized their 'factuality', including the achievements and failures of the respective kings and the events that happened during their reigns, with actual mortuary strategies adopted at the burial ceremonies of the respective kings. Why a certain strategy was chosen/adopted by the person/group who decided as to how a king should be buried will be interpreted. It will be suggested that the kings themselves were involved in the decision as to how their mortuary ceremonial process should be conducted.

Mlyniec, Michael [176] see Almer, Calista

Mlyniec, Michael [50] see Fitzhugh, William

Moates, Jeffrey (FPAN), Eric Prendergast (Cardno) and Rebecca O'Sullivan (Florida Public Archaeology Network)

[193]

Erased to Re-Placed: Collaboration in Search of Zion Cemetery, a Segregation-Era African American Burial Ground in Tampa, Florida

In June of 2019, the Tampa Bay Times broke an explosive story on the discovery of death certificates and historic maps indicating a previously unknown cemetery might lie under a tangle of roads, public housing, and commercial buildings. Florida Public Archaeology Network staff had been working with the reporter for several months, assisting with background research and GIS work. Once the story broke, Tampa Housing Authority (THA) contracted with local archaeologists at Cardno to assess the claims and conduct an archaeological survey. THA formed an Archaeological Advisory Committee of residents, community leaders, and local activists to guide the management of the erased cemetery. CRM and public archaeologists joined the committee in a real-time decision making process open to the press and the community at large. This paper details the importance of a unique collaboration between CRM professionals, public archaeologists, and the press in a project of high public interest.

Moates, Jeffrey (FPAN)

[220]

Discussant

Moe, Jeanne (Institute for Heritage Education)**[103]***Ruthann Knudson: Legacy of Education and Public Outreach*

Ruthann Knudson was always a proponent of archaeology education and public outreach. As her student at the University of Idaho, I got to see Ruthann in action early in my career. Ruthann's dedication to involving the public stuck with me, and everywhere I went for school and employment, I volunteered to go to schools for presentations on archaeological inquiry and stewardship. While working for the Bureau of Land Management in Utah, I was lucky to be a founding member of the National Project Archaeology program, which now serves nearly 40 states with high-quality archaeology education for teachers, students, and informal educators. After retirement, Ruthann moved to Montana and, true to form, became a force to be reckoned with in archaeology and public outreach. Ruthann was an inspiration, a friend, and mentor to all. This paper traces Ruthann's influence on archaeology education and the history of Project Archaeology and the program's impact on the profession.

Moeller, Maddie [63] see Herzner, Louis

Moes, Emily [233] see Ray, Erin

Molina Muñoz, Priscilla [189] see Costa, Philippe

Molinares, Stephen (University of Arizona; LSWHTA), Tony Viola IV (University of Arizona), Sara Chavarria (University of Arizona) and Barbara Mills (University of Arizona)**[184]***Translating Archaeology to Teach Teens*

If future generations don't care about the field of archaeology it will die. As such this poster highlights the processes involved in the development and implementation of strategies for translating academic sources dense with specialist vocabulary into easily accessible language to better engage with non-specialists and relate anthropological issues and theories to their everyday lives. These strategies were used by Linking Southwest Heritage Through Archaeology (LSWHTA), a unique program sponsored by the National Park Service (NPS), which is co-managed by the University of Arizona's College of Education and School of Anthropology, being trialed in Tucson, Arizona. The project aims to get high school students more engaged with national parks and to get them thinking about future careers in the NPS, education, archaeology or anthropology. A discussion on the handouts we tailored for each trip and some of the hands-on activities that we designed for our participants will also be included. Our goals were to give them a better understanding of what went into the technologies used by ancestral peoples, how we tailored expert lectures, lessons, presentations, tours for a high school audience, and finally our techniques for guiding discussions toward key themes among participants.

Mollenhauer, Jillian (Metropolitan State University of Denver)**[191]***Out of Olmec: Continuity and Disjunction in Veracruz Stone Sculpture*

Gulf Olmec sculpture is renowned for the cultural, political, and aesthetic precedents it helped to establish in prehispanic Mesoamerica. Often its legacy is discussed in relation to the artistic traditions of succeeding civilizations that emerged to the south and west of Olman. However, there has been little recognition of the impact Olmec sculpture had on the later cultures of Veracruz. Many examples of Gulf Coast sculpture outside the Olmec heartland have remained virtually ignored by scholars, likely as a result of cultural biases rooted in Western aesthetic sensibilities and the tendency to elevate certain categories of representation over others. Yet, in overlooking these objects we have neglected to see the patterns of continuity and disjunction in Gulf Coast sculpture that lead us from the monuments of the Olmec to those of their Classic and Postclassic successors. This paper attempts to trace these routes of affect and influence through the sculptural traditions of ancient Veracruz.

Mollerud, Katy (Peabody Museum, Harvard University)**[96]***Discussant***Mollerud, Katy (Peabody Museum, Harvard University), Robert Cook (Ohio State University), Sarah Johnson (Peabody Museum, Harvard University) and Annie Greco (Peabody Museum, Harvard University)****[264]***Endings and Beginnings: Revisiting the Peabody Museum's Early Collections from Hopewell and Fort Ancient Sites in Ohio*

Some of the earliest excavations conducted by the Peabody Museum of Archaeology and Ethnology, Harvard University, in the late 1800s concentrated on two of the most important sites in the Eastern Woodlands, Turner and Turpin. These two sites are located a few miles apart along the east bank of the Little Miami River near Cincinnati, Ohio. Turner is a major Hopewell mound complex of considerable renown with some of the only examples in the region of human figurines, gold, and silver. Turpin is a major Fort Ancient village and mound site with early evidence for Mississippian migration into the region. Here we present preliminary results from our ongoing study of these seminal collections. Specifically, we focus on chronological and cultural relationships identifying the temporal placement of Turpin's unusual Peach Orchard component as well as heretofore unrecognized relationships between Turner and Turpin, including Fort Ancient reuse of Hopewell mounds at Turner.

Monaco, Farrell

[118]

Discussant

Monaghan, John (University of Illinois, Chicago), Laura Junker (University of Illinois, Chicago), Ame Garong (National Museum of the Philippines), Michael Canilao (University of the Philippines) and Caleb Kestle (University of Illinois, Chicago)

[188]

Ethnography and Archaeology of a WWII Plane Crash in the Philippines: Social Meanings among the Ifugao

Ethnographers and archaeologists who have long experience working in the areas of the world touched by WWII conflicts, both working in the U.S. government and at universities, provide significant insights into local histories and unique culturally-constructed understandings of the WWII period. We present a case study of collaboration with Ifugao tribal leaders and local Ifugao residents living near a WWII crash site, agencies associated with indigenous peoples, Philippine National Museum archaeologists and cultural property specialists, and University of Illinois at Chicago archaeologists and ethnographers. The downing of a plane in a corn field in Ifugao in the 1940's was etched in the "memory culture" and local history of that time for the Ifugao living near the site of WWII wreckage. Cultural mores and historical references conveyed to the team of Philippine and American scientists were key to eliciting significant data on what happened that day in the 1940's when the American plane came down. Culturally appropriate ritual associated with the initial discussions about collaboration with the indigenous group and rituals of solidarity completed at the end of the collaborative project were key to the recovery effort.

Monagle, Victoria (University of New Mexico)

[97]

Zooarchaeology and the Legacy of Georgia O'Keeffe

Georgia O'Keeffe, an American artist and icon of the twentieth century, is famous for her modernist portrayals of skyscrapers, flowers, and Southwest landscapes. Her works, tools, and homes have since been preserved and shared with the public by the Georgia O'Keeffe Museum and Research Center located in Santa Fe, New Mexico. Among the artifacts preserved by the Museum is the collection of animal bones O'Keeffe used as inspiration for many of her works. In 2019, the Museum approached the University of New Mexico Anthropology Department to document and identify this collection as a means to further connect the public with O'Keeffe's artistic process. In this presentation, I discuss the zooarchaeological results of this project, its benefits to the museum and the community, and the potential it suggests for public archaeology and community outreach in the American Southwest and beyond.

Monahan, Ellis (Cornell University)

[210]

"Structural Violence": Warfare, Fortress Architecture, and Social Inequality on Bronze Age Cyprus

During the Middle-Late Bronze Age (MCIII-LCI) transitional period on Cyprus, fortresses were built atop hills, plateaus, and mountainsides across the island. Yet, prevailing accounts of society on Cyprus during this period now barely mention violence, and in recent decades, several of the monumental fortresses have been reclassified as animal enclosures or redistribution centers, thus divorcing these structures from their potential roles in violence and war. This paper argues that the study of societal change on Bronze Age Cyprus is being hampered by what Lawrence Keeley has aptly called the "pacification of the past." Using the fortresses as a case in point, I consider how these structures served a dual-purpose in Cypriot society, operating both as effective defensive structures and as powerful centers for the renegotiation of social relations into the hierarchically stratified structural inequality that would characterize subsequent periods. In this manner, the fortresses are understood as active participants, and even catalysts, in the transformation of coercive violence into other forms of social control.

Monge, Susan (University of Illinois, Chicago)

[76]

Zooarchaeology of Culebra Bay, Guanacaste, Costa Rica

Excavations in Guanacaste, Costa Rica, especially around the Culebra bay area, have yielded a great amount of well-preserved faunal materials and yet few archaeofaunal studies have been carried out. The lack of trained specialists and comparative collections available has been previously addressed by other researchers working in lower Central America. To try and close this gap, I will present the preliminary results of a faunal analysis carried out between June and August 2019 with vertebrate material recovered in the 1970s by excavation teams under Frederick Lange's direction. These materials were analyzed by referring to the Smithsonian Tropical Research Institute's comparative collection in Panama City, allowing for taxonomic and ecological assignments as well as descriptions of butchery and non-dietary usage, i.e., for fashioning multiple ornaments and tools. The presence of at least one species of turkey (*Meleagris* sp) enhances knowledge about trade routes and human migration in a multi-cultural region at the crossroads of population movements from as far north as Mesoamerica. The presentation of these results seeks to expand the knowledge of archaeology in general from lower Central America and the potential for future research projects, where ancient DNA and multi-elements stable isotope analyses could complement the visual morphometric analyses.

Monnig, Maghan [212] see Morris, Riley

Monroe, Cara [233] see Fournier, Nichole

Montero, Gabriela (University of Kentucky)**[119]***Postclassic to Colonial Ceramic Adaptations in the Eastern Lower Papaloapan Basin*

The concepts of conquest and colony have significant ontological implications. Before the arrival of Europeans, social groups in prehispanic Mesoamerica had already faced many political adaptations to dominant groups, such as the Aztec empire. Some authors have emphasized that economic integration to the Aztec empire was accomplished through a conquest process, yet the Spanish conquest is often perceived as a major rupture point in history. While social and political changes might be more visible for this time period, this idea leads to the common understanding of native populations as a single group of people who adapted to the new regime in the same ways everywhere. As likely happened within Aztec domination, interactions between native populations and Europeans had different implications in each locality, which need to be studied individually. Within this context and through assessing ceramic production, consumption, and distribution, one question that emerges is how people adapted their technologies to the different cultural landscapes. This poster focuses on late Postclassic to contact period adaptations within ceramic production in the Gulf Coast region of the Eastern Lower Papaloapan Basin, Mexico, to investigate how agency and power were exercised by the social groups involved to construct their new cultural landscapes.

Montero, Laurene [71] see Mitchell, Douglas

Montgomery, Shane (Cornerstone Environmental)**[155]***Discussant*

Montoya, Amy [172] see McBrinn, Maxine

Monzon, Juan [147] see Hatcher, Lawford

Moody, Angela**[184]***NRCS Conservation Partnership Invitation*

The Natural Resources Conservation Service (NRCS) is an agency committed to "helping people help the land." With help from its partners NRCS, helps people prepare voluntary and participatory conservation plans for the lands on which they make decisions. TX-NRCS considers cultural resources in its conservation planning for the similar reasons it protects the natural resources. Keeping natural resources in balance helps provide the basis for a healthy and profitable farm environment; protecting cultural resources provides the basis for understanding past land use. The stewardship of these nonrenewable resources is inspired by the conservation ethic that underlies the NRCS mission. All employees who carry out any of NRCS' cultural resources compliance responsibilities at the field and State Office levels require training. We invite partners in conservation, like you, to help train Texas planners to recognize and protect your heritage. Contact the TX-NRCS Cultural Resource Specialist with your ideas.

Moody, Bryony (University of Sheffield), Caitlin Buck (University of Sheffield), Gianna Ayalla (University of Sheffield), Keith May (Historic England) and Thomas Dye (University of Hawai'i at Manoa)**[24]***Automation of Bayesian Chronology Construction Using a Graph Theoretic Approach*

This paper will discuss developing software for handling the relative and absolute dating evidence obtained during single context excavations. Dye and Buck have developed a graph-theoretic approach to representing archaeological sequence diagrams, such as the Harris Matrix. First, they use formal mathematical graph theory to construct "stratigraphic directed graphs". Second, they have established that a "chronological directed graph" can be constructed algorithmically from a stratigraphic directed graph. The chronological directed graph models the stratigraphic relationships needed to construct Bayesian chronological priors. This paper will discuss progress on developing the theory for producing stratigraphic directed graphs, and their conversion into a chronological equivalent. Furthermore, we will discuss how this theory has informed decisions when developing software. Our software will enable the construction of multiple chronological directed graphs, taking into account uncertainty in prior chronological information, therefore, we must consider how to archive these. Other questions might be: how should we handle an archaeologist's inferences about once-whole contexts; how desirable is it to enforce shared semantics in order to standardise record-keeping and processing; what tools are needed to help archaeologists move from the full stratigraphic record to reduced versions which contain only the nodes to be dated via Bayesian chronological modeling?

Moore, David [186] see Harris, Brendan

Moore, James**[169]***Landscapes of Oblivion: Forgetting, Burial Grounds, and Placing the Past*

Forgetting is a cultural act. Memories of burial grounds do not fade away bleached by time. This paper explores the anthropology of forgetting: examining the role of burial grounds as meaningful places in cultural landscapes. The materiality of the burial grounds gives presence to descent, kinship, sodality and the generational transfer of wealth and property. The eighteenth-century Moore-

Jackson burial ground is such a place. Over generations, Moore burial markers were placed to memorialize the social means—marriages, inheritances and kinship—by which farmers acquired land that allowed their offspring to become farmers. The expansion of industrial capital in nineteenth-century New York brought a new social landscape of capital and alienated labor marked out by industrialized waterways, factories, mansions and workers' housing. In this landscape, commercial cemeteries provided places for the landless: both factory owners and their workers. Family burial grounds could be forgotten in plain sight.

Moore, Summer (International Archaeological Research Institute Inc.) and Michael Graves (University of New Mexico)
[262]

Reading between the Lines: A Detailed Examination of Stratigraphy at Nu'alolo Kai and Implications for Investigating the Postcontact Component

The collection of artifacts from Nu'alolo Kai is one of the most significant legacy collections from the Pacific. Excavated in the 1950s and 1960s by archaeologists from the Bishop Museum, the site yielded well-preserved, deeply stratified deposits from the early settlement period to the post-contact period. Several recent research projects have worked to inventory the site's artifacts; one surprising finding to emerge is the apparent contemporaneity of traditional Hawaiian artifacts and foreign materials in the collection's post-contact components. Previous work on the collection has relied on a system of cultural levels created by the original investigators, which separated the deposits into a series of layers at uniform depths within each structure. In this paper, we present a fine-grained analysis of the data that identifies and focuses on excavation units and their associated materials where there are clear stratigraphic separations and an absence of intrusive features. We draw upon the existing artifact identifications that include both historic Euroamerican and traditional Hawaiian materials. Using this revised analysis, we interpret those materials whose stratigraphic associations are confirmed and investigate the factors that may have contributed to their contemporary use and deposition at Nu'alolo Kai.

Moore, Tom (Durham University, UK)

[48]

From Household to Kingdom: The Emergence of Centrality in the Social and Settlement Networks of Later First Millennium BC Western Europe

The emergence of massive complexes, known as "oppida," in the final centuries of the first millennium BC in temperate Europe marked a fundamental transformation in the scale and complexity of Iron Age societies. Research on these monuments has often emphasized their relationship with the expanding Roman Empire, rather than how their emergence related to longer settlement trajectories in the Iron Age. Focusing on case studies from Britain and France, this paper will discuss how recent evidence demonstrates oppida emerged within landscapes that were increasingly intensively occupied, the result of longer-term demographic increases which began in the fourth–third century BC. It illustrates how, oppida were born from existing long-term trajectories in settlement patterns whilst also marking a radical dislocation in social organization. This represented a transformation from dispersed forms of power to the emergence of more centralized locales through which power was articulated, and at an increasingly regional scale. The emergence of oppida, often in distinct ways and manifest in diverse forms, is argued to be intertwined with long-term, continental-wide demographic transformations which took place in the later first millennium BC.

Moragas, Natalia

[133]

"Closed for Refurbishment": Teotihuacan from Classic to Epiclassic

The collapse of Teotihuacan has been a recurrent topic for the archaeology of Mesoamerica but few cases can be considered real collapses. Teotihuacan provides us with one of the few real cases of the end of a culture, centered on a city with very specific peculiarities. In this paper, the general image of the main proposals about the collapse of Teotihuacan will be reviewed, taking into account the archaeological evidence prior to the events of the period of AD 550–600 as well as the subsequent modifications that are identified in the city.

Morales, Carlos [163] see Hernández, Enrique

Morales, Juan Julio [198] see Martínez Vázquez, Dante Bernardo

Morales, Paulino [7] see Horn, Sherman

Morales, Pedro [233] see Somerville, Andrew

Morales, Reinaldo, Jr. (Norfolk State University)

[141]

1492 BC: Invention and Heredity in Precolumbian Painting

Archaic rock paintings from Northeast Brazil provide clear examples of how similarities in style can indicate regional interaction spheres across hundreds of kilometers, distances that were quite reasonable ca. 1492 BC. For example, paintings from Serra da Capivara National Park in Piauí share remarkable similarities with paintings from neighboring states and led archaeologists to postulate a "Nordeste Tradition" to explain this widespread cultural phenomenon. This reflects a degree of cultural continuity that Terence Grieder proposed for the much of the precolumbian Americas. These paintings, however, share significant similarities to

Archaic rock art traditions of the American Southwest. This forces art historians and archaeologists to confront basic assumptions about style analysis—how painting styles reflect cultural continuity or independent innovation—and provides a vehicle to test and refine the analytical tools of our related disciplines. As Grieder (1982) wrote, “Culture is the product both of heredity from cultures which are ancestral to it and of its own adaptation to its environment,” and “some kind of migration is a factor in virtually every society—with migrants providing unconventional responses in their new environments and starting new chains of inventions.” This rock art either reflects some common inheritance or remarkable formal coincidences.

Morales-Aguilar, Carlos (Université Paris 1–Panthéon Sorbonne)

[163]

In the Land of the Codex-Style Ceramics: New Insights on Classic Maya Settlement Organization in the Mirador Basin, Petén, Guatemala

Since the archaeologist Michael Coe named a group of Maya polychrome vessels as Codex-style, many scholars have given attention to study their iconography, epigraphy, and, art history. However, little is still known about the archaeological context of these ceramics. The northern Petén underwent significant transformations in settlement organization between the Early and Late Classic period, that is marked by the increase of population. The “Preclassic” cities were reoccupied, and new settlements emerged in a particular pattern of residential groups clustered around central plazas and patios. The apogee of the area was reached during the late seventh through the middle eighth centuries, which coincides in time with the production of Codex-style vessels. Based on recent archaeological research, this paper provides new evidence of Codex-style ceramics from 36 archaeological sites that contribute to our understanding of the Late Classic settlement organization in the Mirador Basin.

Morales-Aguilar, Carlos [163] see Hansen, Richard

Morcote Ríos, Gaspar [198] see Robinson, Mark

Morehart, Christopher [269] see Villaseñor Iribe, Eunice

Morello Repetto, Flavia (Instituto de la Patagonia, Universidad de Magallanes), Luis Borrero (CONICET-Argentina), Manuel San Román (Universidad de Magallanes), Fabiana Martín (Universidad de Magallanes) and Marta Alfonso-Durruty (Kansas State University)

[119]

Elizabeth Island (Strait of Magellan) at the Crossroads of Marine and Terrestrial Worlds of Fuego-Patagonia

Isla Isabel or Elizabeth Island is a landmark of great historical, ethnographic, archaeological and biogeographical importance within the Strait of Magellan, and deeply integrated into Magellanic cultural history for at least the last 2000 years BP. Its location and environmental location make the island a key reference for the environmental and cultural extremes of the region. A summary of the historical and archaeological records gathered through archaeological studies, taphonomic research and the analysis of the collections that Junius Bird gathered and deposited in the American Museum of Natural History (New York) is presented. In addition, the results are discussed from the perspective of cultural geography and its importance for the populations of Patagonia and Tierra del Fuego, Chile. The conclusions of this multidisciplinary study indicate that the archaeological contexts of Isabel Island respond to its unique situation at the crossroads of the marine and the terrestrial worlds of Fuego-Patagonia. Acknowledgement: Grant FONDECYT 1190984.

Morello Repetto, Flavia [61] see Reyes, Omar

Morello Repetto, Flavia [177] see San Román, Manuel

Moreno, Federica [4] see López Mazz, José

Moreno, Michael [147] see Newell, Zachary

Moreno de Sousa, João Carlos [73] see Okumura, Mercedes

Morer, Ignacio [48] see Fulminante, Francesca

Moretti, John (Museum of Texas Tech University)

[142]

A Thick-billed Parrot from Bonnell (LA 612) in Southeastern New Mexico with Comments on the Archaeological Occurrence of the Species in the American Southwest

Bonnell (LA 612) is significant as a Glencoe phase (AD 1200–1400) Jornada Mogollon settlement in the Sacramento Mountains of southeastern New Mexico. In a recent review of faunal remains recovered from the 1950s excavations, detailed comparative analysis demonstrates that a tarsometatarsus represents *Rhynchopsitta pachyrhyncha*, the Thick-billed Parrot. Skeletal remains of Thick-bills, morphologically distinct from macaws, are known from 10 archaeological sites in Arizona and New Mexico. Thick-billed Parrots are specialist pinecone feeders that inhabit temperate mountain forests in the Sierra Madre Occidental of Mexico. A review

of the archaeological occurrences illustrates that six sites, including Bonnell, are located within or nearby pine forest habitats suitable for Thick-bill ecology. Another three sites are situated within arid environments, but contain clear evidence of prehistoric cultural utilization of forest resources. This biogeographic distribution, combined with evidence from extant ecology, historic occurrences, and reintroductions, demonstrates an association between these sites and viable Thick-bill habitats. Southwestern archaeological Thick-billed Parrots, therefore, likely were procured within the region. This natural occurrence is in contrast to the cultural importation of Southwestern macaws. Accordingly, Thick-bills from Bonnell and other sites provide important evidence of the natural distribution of this presently endangered species.

Moretti-Langholtz, Danielle (College of William & Mary) and Buck Woodard (American University)

[251]

Provenance and Power: Decolonizing Powhatan's Mantle

Popularly known as "Powhatan's Mantle" the shell-decorated animal skin is an iconic object of material culture from sixteenth-century Virginia. On display in the Ashmolean Museum in Oxford, England, we argue that the mantle's provenance and possible links to indigenous cosmology have been obscured by four centuries of colonial domination and interpretation. This paper will review the mantle's known chain of possession from archival and historical references to the Tradescant family and more recent direct physical observations of the object. In an effort to decolonize the mantle we draw on indigenous cosmologies as a possible way to relink the mantle to a dynamic and symbolically-rich Algonquian world view.

Morgan, Christopher (University of Nevada, Reno), Gustavo Neme (National Scientific and Technical Research Council), Adolfo Gil (National Scientific and Technical Research Council) and Miguel Giardina (National Scientific and Technical Research Council)

[15]

Risk Seeking and Risk Mitigation in the High Argentine Andes

Using the Z-score model, we evaluate the costs and benefits of risk seeking behaviors, and the means by which risks were mitigated, at El Indigeno, a massive high-altitude residential site in the south-central Andes. Our model suggest that though climatic amelioration during the site's main period of occupation (1500–800 cal BP) may have played a subsidiary role in reducing some of the risks associated with long term and intensive high altitude occupations, the probability of increased social rewards likely played the principal role in encouraging long-term, seasonal site occupations. Some of the risks associated with these occupations were offset by transport of foodstuffs from lower elevations.

Morgan, Christopher [243] see Neme, Gustavo

Morgan, Kathryn [165] see Diserens Morgan, Kasey

Morgan, Linda (GRIC Cultural Resource Management Program), John Hoffman (GRIC Cultural Resource Management Program), Kyle Woodson (GRIC Cultural Resource Management Program), Chris Loendorf (GRIC Cultural Resource Management Program) and Brian Medchill (GRIC Cultural Resource Management Program)

[229]

Hohokam Pottery Manufacturing Specialization at Lower Santan Village along the Middle Gila River, Southern Arizona

The Gila River Indian Community Cultural Resource Management Program has completed extensive data recovery investigations at Lower Santan Village with over 2,500 cultural features investigated at this prehistoric Hohokam settlement. The village is located on the north side of the middle Gila River on the southwestern flank of the Santan Mountain bajada. The village reached its maximum extent in the late Sedentary period around AD 1150, and subsequently declined in size dramatically in the Classic period (AD 1150–1450). Previous work has shown that pre-Classic period structures at the site have a disproportionately high incidence of pottery manufacturing tools, and the most recent investigations identified a pit house with an exceptional density and diversity of items associated with pottery production. The room assemblage included raw clay, wasters, pottery anvils, polishing stones, and several finished vessels. This house also had a high incidence of non-local items like shell jewelry, but was otherwise similar to other previously investigated habitations, and appears to have been a residential structure. These data suggest that this household specialized in pottery production, possibly on a full-time basis. This paper examines this unique pit house artifact assemblage as evidence for specialized pottery production at Lower Santan Village.

Morgan, Robert (USDA Forest Service, Francis Marion National Forest), Matthew Taliaferro (USDA Forest Service, Francis Marion & Sumter Natio) and Elizabeth Toney (USDA Forest Service, Francis Marion & Sumter Natio)

[77]

Predictive Modeling on the Francis Marion & Sumter National Forests

The Francis Marion and Sumter National Forests use descriptive predictive models to identify where in project areas archaeological resources are more likely to be present. The ACHP has recognized that predictive models, if tested and found to be reasonably efficient, can assist Federal agencies in meeting the identification standards set out in the National Historic Preservation Act. In order for predictive models to be sufficiently strong to be used in compliance, they must address issues of data quality and statistical modeling and fully utilize the capabilities of geographic information systems (GIS) technology. Here, we describe the current descriptive model used on the Francis Marion and Sumter National Forests and the challenges and opportunities related to its utility while presenting new predictive models that graphically illustrate and quantify the descriptive variables. We hope these initial analyses will assist in the development of a more rigorous and easily applicable predictive model for the Francis Marion and Sumter National Forests.

Morris, Rebecca (University of Texas, San Antonio)**[197]***Palace Plans: A Comparative Study of Spaces at Las Ruinas de Arenal, Belize*

This paper examines the architecture and spatial organization of Maya palaces using excavation data from Las Ruinas de Arenal, situated in the Mopan River Valley of Belize 5 km south of Xunantunich. This medium-sized center consists of three groups connected by sacbeob: a ceremonial complex with an E Group and ball court (Group A), an eastern shrine group (Group C), and an elite residential and administrative complex (Group B). Joseph Ball and Jennifer Taschek investigated the site in 1991–1992, and the Mopan Valley Preclassic Project began a long-term project in 2015. In 2019 preliminary investigations were initiated at the palace group. These excavations targeted architectural features associated with the articulation of distinct spaces and the regulation of movement between them. This paper presents the results of these exploratory excavations in Group B within a broader comparative framework of similar residential and administrative complexes in the Maya Lowlands in order to shed light on the potential organization of spaces and activities at the elite palace complexes.

Morris, Riley (University of Missouri) and Maghan Monnig (University of Missouri)**[212]***Lararia in Pompeii: A Spatial Analysis*

The presence of lararia and household religion within Roman societies is a known cultural practice. This study was conducted to gain a greater understanding of where lararia are distributed spatially within Pompeian homes and businesses as it relates to socio-economic status and participation in household religion. The distribution of lararia was investigated through survey of both public access and permit-only areas of Pompeii Scavi. Data regarding house size, individual room size, individual lararium dimensions, and qualitative descriptions of the lararia were collected. Preliminary results suggest that lararia in larger, wealthier Pompeian homes were present in more prominent, social areas of the home whereas smaller properties had similar numbers of lararia housed in more private areas. We have concluded from our data that the distribution of lararia directly correlate to the level of interaction with household religion, with wealthier households participating in ancestral worship in a more public manner.

Morris, Sarah [170] see Horn, Marty

Morrison, Alex (International Archaeological Research Institute) and Timothy Rieth (International Archaeological Research Institute)**[262]***Integrating Legacy GIS and Historic Preservation Data: Examples from Hawaii and American Samoa*

Historic preservation practitioners are particularly well placed for generating large scale syntheses of settlement pattern data and radiometric estimates. However, for the most part, data generated in cultural resource management settings rarely become integrated into well thought out research programs or journal publications. In this presentation we discuss our efforts over the last decade to develop integrated spatial and temporal databases of GIS and radiometric estimates from the islands of American Samoa and Hawai'i. These databases are largely developed using data acquired in historic preservation contexts and through internships and educational programs. We discuss the various ways in which these databases are being used to address regional scale research questions in Samoan and Hawaiian prehistory. Finally, we note that legacy data present a unique set of advantages and challenges that must be taken into consideration before any analytical work can effectively be done.

Morrison, Alex [262] see Filimoehala, Darby

Morrison, Heather (Canyon de Chelly National Monument)**[5]***Portable X-Ray Fluorescence Analysis of Pictographs at Canyon de Chelly National Monument*

In my research, I focused on an actively deteriorating rock art site that lacked complete documentation located in Canyon de Chelly National Monument of Navajo Nation. My research employed a range of advanced site recording procedures and investigated the non-destructive portable X-Ray Fluorescence (pXRF) elemental analysis of pictographs. The aim of the research was to determine the role of pXRF in heritage site management for rock art documentation and to evaluate the accuracy of pXRF analysis for the identification of mineralogical differences between various shades of color. The pXRF examination generated qualitative data regarding southwestern rock art pictographs, the chemical composition of the coloring agents for red, yellow, black, green, white, and orange pictographs, and insight into pre-contact rock painting procedures. The research highlights the effectiveness of pairing pXRF analysis with recording procedures such as D-stretch and photogrammetry for effective Southwestern rock art investigations.

Morriss, Veronica (University of Chicago)**[261]***Power, Piety, and Production: Revisiting the Coastal Fortifications along the Islamic Maritime Frontier*

The Early Islamic maritime frontier of Syria-Palestine was supported by an extensive network of fortified coastal cities, forts, and watchtowers. The fortified outposts that served as nodes in this network are frequently associated with the word *ribat*, a complex term that was applied to a variety of structures through time. This term is problematic and has complicated the analysis of these coastal forts. While typically only discussed in terms of defense, this paper will look beyond their role in conflict to examine them as multifaceted sites. It will draw comparisons and contrasts with the North African *ribat*, as well as the so-called Desert Castles of Syria, Jordan, and Palestine. This paper will propose that these fortifications were important tools for legitimization, places of exchange, centers of religious practice, and potentially loci for settlement.

Morrow, Juliet (Arkansas Archeological Survey) and Stuart Fiedel (Louis Berger Group)**[103]***Toward More Accurate Reconstructions of Paleoindian-Era Social Systems*

Given that we can now reconstruct biological histories of individuals and their relationships with others, we should revisit the topics of sex, gender, and the division of labor. Today it's possible to study these facets of Native American lifeways during the Paleoindian era with new data sources.

Morse, Stanton, Byron Smith (University of Texas, Austin), Marisol Cortes-Rincon (Humboldt State University), Jeremy McFarland (Humboldt State University) and Michael McDermott (Humboldt State University)**[230]***A Remote Sensing Integration of Hinterland Landscapes: Results of Mapping the Dos Hombres Western Peripheral Zone*

This study presents the findings of a remote sensing-based map digitization endeavor by examining archaeological settlements and their correlations to reclassified ecological neighborhoods along the western peripheral zone of the Classic period (250–900 CE) site, Dos Hombres. Located within the Rio Bravo Conservation and Management Area (RBCMA) of northwestern Belize, Dos Hombres was continuously occupied from the Middle Preclassic (1000–400 BCE) to the Terminal Classic (CE 800–1100). Previous archaeological settlement research along Dos Hombres's western peripheral zone indicates a variety of structural and geotechnical features resting under high jungle canopies with low-density surface vegetation. Additionally, an airplane equipped with both multispectral sensor (MSS) and light detection and ranging (lidar) capabilities was flown over Programme for Belize (Pfb) land during the 2016 field season as a part of a larger collective project. A digital elevation model (DEM) of the study area was created from the lidar to georeference the hand-rendered survey maps. As a result, further analyses in various geographical information systems (GIS) were conducted to generate digitally capable maps and geospatial models with the hope of stimulating collaboration among regional specialists. To accomplish collaboration desires, a regional geodatabase is currently being created.

Morse, Stanton [230] see Smith, Byron

Moses, Victoria (University of Arizona)**[22]***Sacrifice, Meat Consumption, and Bone Working at the Curiae Veteres: Zooarchaeological Findings from the Sixth- and Fifth-Century BCE Levels of the Palatine-Pendici Nord-est Excavations in Rome, Italy*

Recent archaeological projects, such as those of the Palatine-Pendici nord-est excavation, are bringing new materials and new clarity to the processes of social change that lead to urbanism in Rome, Italy. The Curiae Veteres sanctuary, located in the heart of Rome on the northern slopes of the Palatine Hill, gives exceptional insight into the earliest rituals of Rome. Here, the large deposits of animal remains dating to the sixth and fifth centuries BCE mostly relate to three activities: animal sacrifice, communal consumption, and bone working. These faunal materials are evidence for early Roman ritual, social structure, and economy. The remains are mostly from the common domesticates across early Roman sites, including pig, cattle, and sheep/goat. However, dog crania and paws, complete cattle skulls with perforations for affixing the skulls to walls, and a range of wild animals such as owl, vulture, crow, and seabass, show the diversity in the offerings and significance of animals at the site. Partially worked cattle metapodials and deer antlers were abundant, showing the development of a new industry in the area. The activities conducted at the Curiae Veteres during the birth of Rome laid the groundwork for the city that followed.

Moss, Jeremy (National Park Service) and Steven Shackley (UCB-Berkley)**[203]***Patterns of Obsidian Procurement and Use at Chaco Canyon, New Mexico*

This paper examines patterning in the use of obsidian at Chaco Canyon from the Archaic period to AD 1300 using X-ray fluorescence results and chipped stone analyses. The study is based on over 1700 obsidian artifacts from over 40 sites in Chaco Canyon, and is one of the largest obsidian provenance studies in the southwest. There are major shifts in obsidian procurement and use over time, suggesting shifting alliances, and trade networks, and possible changes in ritual use or access to mountain environments over time. The closer Mount Taylor obsidian sources dominate during the Basketmaker III period (AD 500–750), but are supplanted by Jemez Mountains obsidian by the AD 900s. This shift appears dramatic considering the obsidians are of equal quality. Obsidian source patterning and diversity differs at small habitation sites compared to Great Houses, suggesting divergent exchange mechanisms. Several rare obsidian sources are represented by projectile points only, perhaps reflecting instances of ritual deposition of arrows or trade in finished projectile points. The diversity of obsidian at some sites suggests social interaction with areas not represented by pottery studies or existing models of cultural development, perhaps reflecting the multi-ethnic nature of Chacoan society.

Most, Rachel (University of Virginia)**[98]***The Legacy and Work of Stephen E. Plog*

Stephen E. Plog, David A. Harrison Professor of Archaeology at the University of Virginia, is, and has been for several decades, a major force in American archaeology, specifically in the Southwest. This paper launches a well-deserved session in honor of Professor Plog and provides an overview of his career, his research, and the impact he has had on many students at both the undergraduate and graduate level. His career began with a stint as a photographer and kitchen hand at the Vernon field school in 1968 and 1969. He then moved on conducting fieldwork and research in Oaxaca, Mexico; Black Mesa and Chevelon, Arizona; and Chaco Canyon, New Mexico. This work was conducted while Steve took on numerous administrative positions at the University of Virginia including program director, Department Chair, and Associate Dean for the College of Arts and Sciences. While doing all of this, he continued teaching both undergraduate and graduate level seminars influencing just over four decades of students. His

contributions to the discipline are profound and significant and will be briefly outlined in this paper before hearing from several generations of former students, all now colleagues.

[98]

Chair

Motta, Laura [234] see Gavériaux, Fanny

Motti, Josefina [173] see Nores, Rodrigo

Moxham, Jasmin [202] see Garcia-Herreros, Jorge

Moyes, Holley (University of California, Merced) and Erin Ray (University of New Mexico)

[137]

Lost Rites of the Ancient Maya: The Corn Offerings of Eduardo Quiroz Cave

In 2018 the Las Cuevas Archaeological Reconnaissance (LCAR) project began investigations at the well known site of Eduardo Quiroz cave in western Belize. The site was investigated in 1963 and reported in an excellent monograph by David Pendergast in 1971. The goal of the LCAR was to assess any recent damage to the site, to produce a new site map, and to document the cave's architectural features. Located in an area unreported by Pendergast was a deposit that constitutes a practice unknown in cave archaeology and unique to Maya cave ritual. Located beneath an overhang were 16 clusters of a white clay-like material containing impressions of hundreds of small corn cobs and other plant materials. In this paper we discuss this unusual find as well as other corn offerings from sites in Belize dating from the Late Classic to the Postclassic period and contextualize these rites within a sociopolitical framework.

Moyes, Holley [237] see Voorhies, Barbara

Mraz, Veronica, Mike Fisch (Kent State University), Metin Eren (Kent State University), Owen Lovejoy (Kent State University) and Briggs Buchanan (University of Tulsa)

[232]

Thermal Pretreatment of Stone Increases Toolmaking Skill

Intentional heat treating of toolstone has been documented to have begun at least by 70K BP; however, the advantages of such treatment have been debated for decades. There are two schools of thought with regard to its purpose. One, is that it merely reduces the force required for flake propagation. A second is that it also alters flake morphological properties. We systematically tested these hypotheses by generating flakes from chert cores exposed to three different temperatures (ambient, 300°C, and 350°C) using automated propagation procedures that bypassed any human agency. While the force propagation magnitude is altered by heat treatment, the flakes were not. We examined these flakes according to nine measures of morphology. None differed significantly or systematically within the three temperatures. While our results confirm that heat treatment does reduce the force needed for flake propagation, they also demonstrate that heat treatment has no significant effect on major morphological aspects of flake form.

Mrozowski, Stephen (Fiske Center for Archaeological Research, University of Massachusetts, Boston)

[112]

Hybrid Architectural Forms in Colonial New England

The period following King Philip's War (1675–1676)—also known as Metacombet's Rebellion—saw many Indigenous communities dealing with instability and rapid change. As the eighteenth century progressed, more and more Indigenous land was sold to or appropriated by English colonists. The history of this colonial encounter is being rewritten through several long-term projects involving collaborations between university and CRM-based archaeologists and the tribal nations of New England. One of these—the Hassanamesit Woods Project, a long-term collaboration between the Fiske Center for Archaeological Research at the University of Massachusetts Boston and the Nipmuc Nation—has focused on the Nipmuc community of Hassanamesit located in what is today Grafton, Massachusetts. Employing a combination of spatial and material cultural analysis as well as documentary, geophysical, soil micromorphological, and botanical analyses this paper presents an overview of the various Nipmuc architectural forms unearthed during close to two-decades research. Several types of building forms and landscape features are discussed as part of a broader examination of the steady dispossession of Hassanamisco land.

[112]

Chair

Mt. Joy, Kristen (Texas Army National Guard)

[52]

Integrated Cultural Resource Management Plans: Dream versus Reality

Department of Defense Instruction 4715.16 mandates installations to use an Integrated Cultural Resource Management Plan (ICRMP) to implement cultural resources programs for regulatory compliance. Over the years, service branches have experimented with standardized templates, alternate procedures and other documents to meet the requirements set forth in the DoD Instruction. However, aligning cultural resource investigation and management projects with the installation's projects and mission can be a challenging endeavor, not just in creating a functional plan to read, but in the action that plan is implementing. Texas Army National

Guard's existing ICRMP is currently undergoing a five year update and serves as an excellent opportunity to analyze lessons learned in working to achieve a positive and successfully integrated balance of cultural resource preservation goals within a larger framework of active military installations.

Mt. Joy, Kristen (Texas Army National Guard)

[113]

Moderator

Mueller, Natalie (Washington University in St. Louis) and S. Margaret Spivey (Harvard University)

[166]

Poverty Point Objects as Icons: Plant and Animal Imagery

The Late Archaic Poverty Point site (ca. 3600–2800 BP) contains a unique combination of monumental architecture and material culture that have made it a flashpoint in discussions of hunter-gatherer complexity and lifeways for decades. Poverty Point Objects (PPOs) are the site's hallmark artifact. PPOs are small baked-clay objects, thought to be used for boiling or roasting food, that are found at Poverty Point by the millions. Their composition, common forms, and distribution outside of the Poverty Point have been investigated, but they have never been considered from an iconographic perspective. This is curious because they were likely the key token that visitors to the site took back to their faraway homes, and thus represent a potent means for the long-distance communication of ideology. Here, we consider plant and animal effigy PPOs and offer some preliminary ideas about their function and symbolism.

Mueller, Natalie [78] see Belcher, Megan

Muianga, Décio (University of Uppsala) and Enio Tembe (Kaleidoscopio, Research in Culture and Public Pol)

[250]

One Hundred Years of Mozambican Archaeology: Past, Present, Future, and Challenges

Mozambique as a country located in the East but also in Southern Africa and has a diversity of important archaeological evidences revealed over the last 100 years as a result of individual enthusiasm and systematic academic research. Since then, however, large parts of this past remains poorly explored and its archaeological heritage is still largely explained in terms of better known sequences to the south, west and north. This essay examines chronological and archaeological methods, heritage policy and practice in Mozambique over time. Drawing on archival research and interviews with practitioners, the essay problematizes current conventions on how and what is been done to explain and understanding the longevity of the prehistoric evidences continuously uncovered. The prehistoric understanding of the complex uncovered past studied has been done in a fragmentary manner. We show that more cooperation/sharing of results is needed between archaeologists working in Mozambican prehistory and history for the new trend of discussions that we want to engage in theory, methods and practice of the discipline. Thus, we argue that major challenges to archaeological practice in Mozambique are subsidiary to academic discussions on the disciplinary boundaries.

[250]

Chair

Muianga, Décio [250] see Stempfle, Sabrina

Mulder, Stephennie

[261]

The Ceramics of Balis: Toward the Recovery of Lost Heritage

This paper will present a major new analytical study of an important Islamic-period archaeological ceramics assemblage produced during 12 years of excavation of Balis, a medieval Syrian city. With over 1,000 photographs and drawings compiled over my 10 years as head ceramicist on the site, this study will be among the most comprehensive Islamic archaeological ceramics studies published to date. Balis was a ceramic manufacturing center with hundreds of kilns, and the study has the potential to transform our understanding of medieval Islamic ceramic production, use, and aesthetic value—particularly for early Islamic ceramics, about which is little known. Publication of this catalog is more urgent than ever because Balis has been under the control of various groups in the Syrian conflict, including ISIS, and looting has been extensive. This project, then—aside from its archaeological value—will form one contribution to cultural heritage preservation in a region endangered by war.

Mullen, Alice (University of the Witwatersrand)

[204]

Rereading Art, Rewriting History in San Rock Art: Indigenous Ontology versus Academic Interpretation

Archaeology loves a category. From typologies to temporal separations, we tend to divide the past by type. The irresistible draw of 'Big Man' theories have impacted, sometimes negatively, upon interpretations of Africa's past. The process of decolonizing this past involves questioning the validity of the categories we employ. In the case of the rock art of the Drakensberg Mountains in southern Africa, a reexamination of nineteenth-century [xam] and twentieth-century San ethnographies of Botswana with recognition of San ontology as relational has allowed scholars to identify disconnects in recent rock art interpretations. This paper uses a 'class' of imagery, the Significantly Differentiated Figures (oversized, highly embellished anthropomorphs), as an example of such disconnects, and offers new avenues for interpretation of these images within a new animist framework. The paper also speaks to wider developments within rock art research, following the ontological turn in social sciences.

Muller, Jordin, Brendan Ermish (University of Utah) and Shannon Boomgarden (University of Utah)**[245]***Historic Excavation of Irrigation Systems and the Implications for Prehistoric Agriculture*

Range Creek Canyon is an isolated canyon on the Tavaputs Plateau in Eastern Utah. The canyon has a deep history of human occupation ranging from Fremont farmers 1,000 years ago to historic homesteading and modern cattle ranching. For the past 17 years the University of Utah Archeological Field School has been documenting and researching the prehistoric and historic events of this canyon. Research has focused on productivity of maize farming by conducting actualistic experiments designed to replicate the decisions made in the past under varying environmental constraints. The experiments primarily record the costs and benefits of various farming techniques, particularly those related to irrigation. In Range Creek Canyon, evidence for Fremont age farm fields on the valley floor are found between 50 cm and 75 cm below the present ground surface. Historic farming activities often mask prehistoric features located below the ground surface. Prehistoric ditches in particular were often reused by European settlers. In 2019, the field school excavated a historic irrigation ditch found adjacent to a Fremont residential site to document its depth and shape. Exposing the historic ditch informs on past irrigation techniques and guides our search for additional data related to the Fremont farming activities in the area.

Muller, Jordin [245] see Boomgarden, Shannon

Muller, Jordin [245] see Ermish, Brendan

Muller, Leticia [161] see Kipnis, Renato

Mullins, Patrick (University of Pittsburgh) and Brian Billman (University of North Carolina, Chapel Hill)**[174]***Transition in a Place Between: Salinar Phase (500 BCE–CE 1) Settlement Patterns in the Chaupiyunga of the Moche Valley*

In the Moche Valley, the dusk of Chavín brought the end of millennium-long traditions of large ceremonial centers (Guañape Phase, 1600–500 BCE) and ushered in a long period of socio-political fragmentation and endemic conflict (Salinar Phase, 500 BCE–CE 1). Synthesizing two full-coverage pedestrian surveys of the Moche Valley chaupiyunga conducted by Billman (1990–1991) and Mullins (2017–2018), we focus on chaupiyunga settlement patterns in order to better understand this period of socio-political transition and change. As the main coastal-highland borderland of the Moche Valley, the chaupiyunga landscape exhibits many scars of the ebb and flow of coastal and highland people and polities throughout prehistory. Our settlement pattern analyses use measures of visual interconnectedness and demographic tethering to articulate the changing connections built between peoples and places during the transition from the Guañape to Salinar Phases. Though Salinar Phase chaupiyunga populations were somewhat bound to the older Guañape Phase landscape and its huacas, they simultaneously were forging newer connections with newer places. We argue that these new connections were intertwined with changing norms in land ownership and tenure, likely over coca-fields, eventually contributing to the endemic conflict characteristic of this phase.

[174]*Chair*

Mullins, Patrick [174] see Billman, Brian

Mulrooney, Mara (Pacific Legacy Inc.) and Mark McCoy (Southern Methodist University)**[262]***The Production of Obsidian Pupils for Moai Eyes: New Geochemical Sourcing Data on Legacy Artifact Collections on Rapa Nui (Easter Island)*

Rapa Nui's only anthropological museum, The Museo Antropológico Padre Sebastián Englert, cares for extensive legacy collections of obsidian artifacts. Since its founding in 1973, the museum has served as the island's only repository for archaeological collections, and its holdings include tens of thousands of all types of artifacts and samples from hundreds of research projects carried out on the island. Among these are obsidian artifacts from domestic contexts as well as distinctive flaked obsidian pieces created to be the pupil set inside the inlaid coral eyes of moai (statues). Although some of these legacy collections lack secure provenience, they still hold much value for research using modern techniques. Here, we describe our analysis of selected legacy collections of obsidian artifacts using portable x-ray fluorescence. Utilizing portable, non-destructive technology, we were able to examine island-based museum collections to investigate obsidian procurement and production without the need to transport artifacts from the island for analysis. We discuss our findings relative to other recent research on obsidian technology on Rapa Nui.

Mundell, Leah [184] see Ekdahl, Amanda

Mundt, Jessica (VCP Alexandria) and Jasmine Heckman (Veterans Curation Program)**[187]***The Veterans Curation Program: 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 10 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 poster explores the varied approaches to public archaeology within the Program and the results of these efforts.

[187]*Chair*

Mundt, Jessica [187] see Reid, Amy

Munoz, Cynthia (UT San Antonio), Raymond Mauldin (UT San Antonio), Robert Hard (UT San Antonio), Michelle Carpenter (UT San Antonio) and Kristin Corl (UT San Antonio)
[179]

Isotopic Signatures of Hunter-Gatherers on the Texas Gulf Coast: Cayo del Oso (41NU2)

The Cayo del Oso site (41NU2) is a large prehistoric cemetery along the Texas Coast. The site is one of several cemeteries in this zone, some of which start to be used by hunter-gatherers more than 7,000 years ago. Known since the 1890s, the removal of over 180 interments from 41NU2 is documented, but the site likely contains hundreds of other burials. Our database consists of just over 50 individuals with valid stable carbon and nitrogen isotopic values from collagen and apatite. Most of these individuals are directly dated by radiocarbon. They primarily come from the work of A. T. Jackson (Jackson et al. 2004) who, in 1933, excavated a 50 x 40 foot area and recovered 105 individuals. The dated individuals in Jackson's excavation show a narrow time range. Based on the medians of radiocarbon dates, over 80% of these burials fall between 1282 and 1382 cal BP. Collagen stable carbon isotopic values ($\delta^{13}\text{C}$) are about -10‰, carbon values from apatite are around -6‰, and nitrogen values ($\delta^{15}\text{N}$) average over 12‰. These data are consistent with a dependence on estuarine resources. Lower inputs from freshwater stream and terrestrial resources may suggest reduced access to these nearby zones.

Munoz, Cynthia [179] see Mauldin, Raymond

Munoz, Samuel [255] see Schroeder, Sissel

Muñoz, Lizette (University of Pittsburgh), Susan deFrance (University of Florida), Nicola Sharratt (Georgia State University), Verónica Rosales (Universidad Nacional Mayor de San Marcos) and Alejandra Tazza (Universidad Nacional Mayor de San Marcos)
[260]

Plants, Animals, and Pottery: Local and Regional Interaction at Tumulaca la Chimba during the Late Intermediate Period

Stylistic analyses of material culture have long been central to archaeological reconstructions of cultural diversity in Andean South America during the Late Intermediate Period (LIP). Coupled with recent applications of compositional analyses of craft goods, artifact form and style also offer insight into inter and intra-regional trade and exchange between late prehispanic groups. In this paper, we complement existing object-focused perspectives by considering how diet and culinary choices were affected by and contributed to local processes of ethnogenesis and to inter-group interactions during the LIP. We discuss the results of faunal and archaeobotanical analyses of both pre-AD 1250 early LIP (Tumulaca occupation) and late LIP (post-AD 1250) Estuquín domestic and mortuary contexts at the site of Tumulaca la Chimba, in the upper Moquegua Valley, Peru. We examine the archaeobotanical and faunal data in conjunction with data derived from compositional analyses of pottery to suggest that despite evidence for growing hostilities in the later LIP, extra-local interactions, particularly with the coast, increased through time, but access to non-local resources was restricted to specific products.

Muñoz, Lizette [143] see Weaver, Brendan

Munro, Andrew (College of Professional and Continuing Studies, University of Oklahoma) and F. Joan Mathien (Chaco Culture NHP Museum Collection, Hibben Center)
[197]

Bonito Phase Architectural Syntax and Social Change

Two multi-century architectural traditions are documented among ancestral Pueblo structures in the San Juan basin, including orientations to the south-southeast and the cardinal directions. Beginning in 2007, new surveys at 21 Great Houses and two stand-alone Great Kivas were conducted under a series of NPS and BLM permits. These confirmed the two orientation traditions and identified two additional architectural traditions at Chaco. One group of Great Houses is oriented to the east-southeast, and many Great Houses are built at locations where solstice sunrise or sunset can be observed to interact with local horizon foresights. One or more of the four traditions are confirmed for every assessed structure save three. Temporal analysis of these four traditions provides an additional line of evidence for multi-cultural collaboration at Chaco during the Early and Classic Bonito Phases. In addition, the analysis highlights consistent cosmological associations among Late Bonito Phase Great Houses at Chaco that clarify their likely purpose. Using multiple lines of material culture evidence to provide context, we suggest that Late Bonito Phase Great Houses (esp. "McElmo Units") were designed as spaces for performative ritual activity conducted by regional antecedent sodalities that had detached from elite lineages after 1100 CE.

Munro, Kimberly (Louisiana State University)
[174]

Revitalization and Acts of Renewal at the Kareycoto Mound: The Terminal Early Horizon at the Cosma Complex, Ancash, Peru

This paper examines the Upper Nepeña Valley, along the Jimbe River branch and its tributaries. Numerous Early Horizon centers were documented throughout the upper valley, with a distinctive settlement pattern and construction to sites within the lower and middle valley. Survey and excavation at the Cosma Complex has highlighted a localized tradition of renewal rites and infant interments occurring between 700–300 BCE. Reutilization of the large Late Preceramic mound known as Kareycoto, for feasting activities in conjunction with juvenile and infant interments are a distinct marker for Cosma. Carbon dates have pointed to a lull in use of Kareycoto, from the Initial Period until approximately 700 BCE, corresponding to the transitional time period after Chavin's collapse. At this point, Kareycoto is reinterpreted as a center for revitalizing rituals associated with infant and other votive offerings.

The reuse of this Preceramic mound to inter juveniles as the last construction phase may indicate the effort of the prehistoric Cosma community to retain and return to earlier localized traditions. Work in Cosma contributes to our understanding of post-Chavin activities in the central Andes, and how local people may have returned to former religious monuments in order to establish regional claims to local landscapes.

Munson, Jessica (Lycoming College)

[29]

Living on the Edge: Alternative Network Models for Socio-spatial Analysis in Archaeology

Recent studies using network analysis in archaeology seek to understand the interactions and structures that defined past societies. Such approaches are based on graph theoretic models that are simplifications of reality used to conceptualize and describe relationships, either qualitatively or quantitatively, between a set of components interacting in a social system. The appeal of this approach stems from its explicit emphasis on the relationships between the entities of interest. Frequently, those relationships are inferred based on the assumption that similarity in site assemblages is a proxy for the existence of a tie. This approach, however, runs the risk of circular reasoning if assumptions about the types of ties are not made explicit. Other approaches consider physical location and geographic distance for reconstructing archaeological networks. While the phenomena archaeologists study using networks is inherently both social and spatial, these models rarely take into consideration the broader landscape and natural features on which these processes play out. This paper presents an alternative approach to identify ancient communities based on dendritic network topology. The basic model is described and illustrated with a case study using settlement pattern data recently collected by the Proyecto Arqueológico Altar de Sacrificios from the Upper Usumacinta Confluence Zone.

Munson, Jessica (Lycoming College)

[155]

Discussant

Murakami, Tatsuya (Tulane University), Shigeru Kabata (Kyoto University of Foreign Studies) and Julieta Lopez (Universidad Nacional Autónoma de México)

[128]

Social Acceleration in Terminal Formative Central Mexico: Urban Growth, Volcanic Eruptions, and Regime Shifts

The Terminal Formative period (100 BC–AD 250) in Central Mexico is characterized by population nucleation at major centers and a series of volcanic eruptions that devastated the southern Basin of Mexico and Puebla-Tlaxcala region. Our research at Tlalancaleca, Puebla, suggests that, after the Plinian eruption of Popocatepetl around AD 70, urban growth and monumental construction accelerated resulting in frequent changes to the built environment. Parallel to these changes, we see the appearance of new construction techniques, new architectural styles, and the “fire shrine” as a new kind of public building. The convergence of environmental, technological, organizational, and ideological changes at an increased pace would have fostered unpredictable future for inhabitants at Tlalancaleca and perhaps in greater Central Mexico. Such a chaotic moment might have contributed to making old regimes susceptible to change or outright replacement. We argue that acceleration of coupled socio-environmental changes triggered regime shifts, resulting in the creation of the Teotihuacan state and the decline of Formative cities. Finally, we discuss divergent and convergent trajectories of social transformation between Central Mexico and the Maya area and their implications for better understanding the Terminal Formative/Protoclassic from a Mesoamerican perspective.

Murata, Satoru (University of New Hampshire) and Adam Kaeding (University of New Hampshire)

[14]

From Rural Hinterlands to Urban Centers: Investigating Ancient Maya Settlement in the Lower Belize River Watershed

One of the primary objectives of the Belize River East Archaeology (BREA) project has been to identify and document archaeological sites in a relatively understudied part of north-central Belize that encompasses the lower Belize River Watershed. In this area, which measures roughly 6,000 km², the BREA team has been pursuing such a goal with a suite of methodologies tailored to the wide range of micro-environments characterizing the survey area. The methodologies employed include informant survey, pedestrian reconnaissance, Total Station and unmanned aerial (drone) mapping, as well as surface/subsurface sampling and excavation. This has resulted in the identification of nearly 100 discrete archaeological sites comprising thousands of archaeological structures. Using a series of site typologies, we classify and compare the ancient Maya settlement in the lower Belize River Watershed, which ranges from urban political centers to rural residential hamlets. This regional settlement study demonstrates how site location and settlement histories were shaped by the micro-environments found in this low-lying coastal zone (i.e., the rivers, creeks, wetlands, estuaries, dense forests, open savanna, etc.) and how these natural features impacted people's movements and their relationships with the landscape as human-environment interactions changed through time.

Murata, Satoru [14] see Willis, Mark

Muro, Luis (Pontificia Universidad Católica del Perú/Ministerio de Cultura)

[106]

From Discrete Frontiers to Crosscutting Religious Networks: Religious Monuments and Cultural Syncretism in the Peruvian North Coast and Highland, Ninth–Eleventh Centuries AD

Colonialist perspectives of territorial expansion envision the social entities as spatially defined by discrete frontier boundaries. Under this approach, the distribution of objects a given cultural style parallels the area of influence of the groups that produced such style. This approach, however, fails to account the dissemination of intangible expressions of culture. In this paper, I seek to re-position the role of religion in the debates of cultural change, syncretism, and ethnic symbiosis in Andean archaeology. By drawing on my own research in San José de Moro and its monumental landscape, I look to further investigate the relationships between the built

landscape, religion, and cultural identity in Peruvian northern region during the ninth and eleventh centuries AD. Particular and recurrent features in religious monumental buildings, from both the Peruvian north coast and highland, suggests that coastal and highland societies were interlinked not only through trade networks and political affinity but also shared religious worldviews and death ideologies, which can be better understood as cross-cultural religious networks.

Muros, Vanessa (Cotsen Institute of Archaeology), Emily Rezes (UCLA/Getty Conservation Program), Lavina Li (Queens University) and Elena Bowen (UCLA/Getty Conservation Program)

[268]

Preservation and Conservation Education at the Corral Redondo Archaeological Project

Cultural heritage preservation has been an integral component of the Corral Redondo Archaeological Project. The emphasis has been not only on the conservation of archaeological objects but also the integration of archaeological conservation education into the field school module. In this paper we will present the conservation efforts undertaken over two seasons that centered on the preservation of artifacts at the Museo Escolar Lumbreras Salcedo and the reinstallation of the museum. Methods for the examination and documentation of the collection, first aid conservation measures, and archival storage and display approaches will be highlighted. We will also discuss how field school students were incorporated into the various preservation initiatives implemented as a way to introduce them to archaeological conservation and the types of cultural heritage work that can be conducted in the field.

Muros, Vanessa [268] see Jacobs, Iris

Murphy, Beau (University of New Mexico), Frances Hayashida (University of New Mexico), César Parcero-Oubiña (Spanish National Research Council), Mariela Piño and Andres Troncoso

[224]

Imperial, Indigenous, or Something In-between: Investigating the Layout of an Inka Administrative Center in Northern Chile

While there are over 1,000 imperial Inka archaeological sites across the Andes, the logic behind many aspects of Inka settlement planning are poorly understood. Notably, comparative research has begun to elaborate on the role of the built environment in the politics of inequality and conquest, with architecture often used to strategically reorganize subjects and embed political symbolism into the landscape. This study approaches this issue with an evaluation of Inka provincial administrative settlement design, and how settlement planning may have been used by the empire as a tactic of social manipulation. The presentation brings past Inka scholarship on this theme—as well as cross-culturally based theory—to bear on a case study of the layout of Turi, a local settlement co-opted by the Inka as an administrative base in northern Chile. The political significance of pathways, access points, specific buildings, and the larger settlement plan is evaluated, as well as the authors' ongoing attempts to isolate strategic imperial design features from the mixed Inka-local settlement. Several potential sociopolitical scenarios that may explain patterning in the currently visible architectural features—and the substantive differences between them—are discussed.

Murphy, Megan

[214]

Identifying Global Trade Connections at Fort Vasquez, a Nineteenth-Century Trading Post

Fort Vasquez was constructed in 1835 at the end of the North American Fur Trade in northeastern Colorado. The site was excavated in the 1970s by Dr. James Judge and a handful of field school students. The excavation revealed thousands of artifacts, many of which were trade goods that illustrate the impressive global trade connections of this nineteenth-century adobe outpost. It was not until 2018 that the artifacts were subjected to an in-depth analysis to determine these exact connections. This poster presents my analysis of several trade good categories including clay pipes, glass trade beads, ceramics, and a hawkbell, and the origins of said artifacts. This case study ultimately places Fort Vasquez in a web of global consumerism and colonial expansion in an increasingly connected world during the nineteenth century.

Murphy, Nell (American Museum of Natural History)

[96]

Moderator

Murphy, Timothy

[204]

Contemporary Human Behavior at Rock Art Sites: Learning from Our Interactions

This paper discusses current visitor behavior at rock art sites using frameworks of phenomenology and landscape archaeology to understand a human desire to connect with important landscapes and histories. This perspective is a reflexive approach to understand the usefulness of qualitative observations that can lead to meaningful research questions, site management, and preservation of rock art.

Murray, John (Arizona State University), Scott Keohane (Arizona State University) and Andrew Zipkin (Arizona State University)

[38]

Experimental Identification of Heat-Treated Silcrete Using Colorimetry and Reflectance Spectrophotometry

The heat treatment of stone for tool production represents one of the oldest technologies for transforming the material properties of a natural product to better suit human needs. The earliest evidence for such technology is the heat treatment of silcrete at the South

African Middle Stone Age site Pinnacle Point 13B, ~164,000 years ago. Despite its importance for early human cognition and technology, relatively little is known about the origins of heat treatment due to methodological constraints faced by researchers. Traditionally archaeologists identified heat treatment using color change determined by an expert analyst. This is a relatively reliable method, but it is difficult to replicate across analysts and studies. To address this issue, we used a UV-Vis-NIR spectrophotometer to record nanometer-scale wavelength reflectance and calculate CIE L*a*b* color values for experimentally heat treated and unheated silcrete from three South African sources, with multiple nodules from each source. Results indicate that colorimetry is useful but insufficient for discriminating heated from unheated silcrete. This is in part due to variability in initial natural color intra- and inter-source. Our study suggests that quantitative colorimetry should be supplemented by additional variables to build a robust method for identifying heat treatment in the archaeological record.

Murray, John [38] see Carroll, Peyton

Murray, John [38] see Martin, Miles

Murray, Sarah (University of Toronto)

[210]

Violence, Destruction, and Commodity Distribution in Early Greece

This paper examines the relationship between violence, inequality, and states through a case study of commodity distribution across a period of sociopolitical transition during the Greek Bronze Age. During the Late Bronze Age the so-called Mycenaean states were organized as hierarchical bureaucracies likely established at least in part through consolidating means of coercive force. Due to circumstances that remain poorly understood, these states were destroyed around 1200 BCE and a period in which strong state structures are not apparent archaeologically followed. In order to assess the way that the violent destruction of wealth at this time may have impacted levels of inequality, I present a comprehensive database of select commodities known from sites in Greece dated prior and subsequent to 1200 BCE. Gini coefficients describing these data show a great increase in the spatial equality of commodity distribution after the destruction of the Mycenaean states. The evidence therefore seems to bear out a hypothesis linking periods of radically decreased equality with large-scale destruction or violent redistribution of capital.

[210]

Chair

Murray, Sarah [210] see Leppard, Thomas

Murtha, Timothy [202] see Schroder, Whittaker

Murungi, May [11] see Val, Aurore

Musch, Abigail (American Museum of Natural History), Anna Semon (American Museum of Natural History) and Thomas Blaber (American Museum of Natural History)

[119]

Artifact Analysis from STP Surveys Provides Perspective on Landscape Use

Between May 2017 and May 2019, American Museum of Natural History archaeologists conducted limited shovel test pit surveys in an effort to locate a sixteenth- or seventeenth-century Spanish fort and an early French settlement on a western portion of St. Catherine's Island, GA. In total, 278 STPs were excavated, many prehistoric shell middens identified, and over 1,000 artifacts recovered. The majority of artifacts collected were prehistoric ceramics, spanning the Late Archaic to the Mississippian period. Additionally, lithics, historic ceramics, glass, brick, pipe fragments, and nails were found. While the artifact and spatial analyses showed no conclusive evidence of the early Spanish or French settlements, this project has provided a greater understanding of landscape use of this area over time.

Musser-Lopez, Ruth (CSUSB)

[204]

Tonantzin? Circling 'Round the Rock Art at Petroglyph Corral, Nevada

Rock art can be fully loaded with cultural dynamics ready to interpret, yet in a professional archaeological context such interpretations are often stigmatized and lumped together as religious or ritualistic "hocus pocus" then underreported or carelessly described. Attempts to determine function or cultural "norms" by ascribing purpose and counting elements or motifs (i.e., how many representational, curvilinear, rectilinear or abstract elements) in the same way one would catalog pot sherds slight the importance of placement of the art and location of the site that contains it. At Petroglyph Corral, Nevada (26LN4699), a hermeneutic approach was taken to interpret the function and meaning of rock art, not beginning with counting but by circling around the art taking into consideration placement, the entangled slate of motifs on natural breaches and stains, earth's "feminine places," iconography and metaphor, ethnography, linguistics, identity, memory, monumentality associated with apparitions, and a new world perspective to invite an interpretation having to do with the phenomenon of the mother goddess Tonantzin of classical Aztec mythology, the Nahuatl, and Proto-Uto-Aztecs.

Myagmar, Erdene [62] see Vlok, Melandri

Myers, Emlen [221] see Siegel, Peter

Myers, Joshua (Indiana University-Purdue University Indianapolis) and Alex Badillo (Indiana State University)
[167]

Bethel Cemetery: SfM Photogrammetry and Digital Mapping in Burial Excavation

During the summer of 2018, cultural resource management professionals in collaboration with local universities excavated a nineteenth-century cemetery in an urban setting as a component of planned infrastructure expansion by the Indianapolis International Airport. Project managers designed and employed structure from motion (SfM) photogrammetry to document burial excavations. SfM photogrammetric methods was not only an expedient and efficient method for mapping, but it also provided project researchers the data necessary for bioarchaeological study. In the end, the photogrammetry team had recorded and digitally reconstructed 3D models of over 300 exhumations. This paper summarizes the procedures and protocols of 3D mapping of burial excavations at Bethel cemetery, presents the resultant 3D models, and demonstrates how these models can be used in GIS.

Myrbo, Amy [59] see Beamer, Dawn

Naegele, Kathrin (Max Planck Institute for the Science of Human History), Yadira Chinique de Armas (University of Winnipeg), Silvia Hernandez Godoy (Grupo de Investigación y Desarrollo, Dirección Pro), Ulises Gonzalez Herrera (Instituto Cubano de Antropología, La Habana, Cuba) and Johannes Krause (Max Planck Institute for the Science of Human History)
[173]

Investigating Diversity in the Prehistoric Insular Caribbean: An Integrated Approach

The Caribbean was the last major region of the Americas to be settled by humans and the first to suffer the impact of European colonization. This major disruption erased most variation in indigenous languages, cultures and genetic ancestries shaping the past and present of people in the Caribbean. Decades of archaeological studies have already uncovered a tremendous diversity in material culture and lifestyles, suggesting several waves of migration into the region during the last ~6,500 years, in sharp contrast to the oversimplification by European chroniclers. Archaeogenetics can add detail to this research topic by studying the genetic diversity and history of pre-colonial human populations. Limited DNA preservation and low genetic resolution challenge population-genetic analyses using traditional tools. In this project, we established and maintained close collaboration with archaeologists and physical anthropologists through systematic reports, regular visits and international workshops organized to bring together disciplines that study human history. This has immensely increased our understanding of the variation in past Caribbean societies, one that might have been overlooked by a data-driven approach only. In various meetings, we shared knowledge about methods and analysis and discussed the terminologies used to describe ancient societies to not perpetuate outdated concepts anchored on post-colonial narratives.

Nagaoka, Lisa (University of North Texas)
[226]

The Anthropocene as a Meme

The Anthropocene has become a powerful concept to frame human-caused environmental change. As the only discipline that studies people's relationship with the environment into deep time, archaeology gains long-sought-after relevance by associating the archaeological record with the Anthropocene. However, there are issues with this relationship. The Anthropocene has several definitions and points of origin. Teaching archaeology in the context of the Anthropocene should address the different agendas and implications of each. The geologic Anthropocene will likely cover only the post-1950s modern era. On the other end of the spectrum is the Anthropocene that goes back to the origin of humans. In the former, the Anthropocene can be compared and contrasted to the archaeological record; with the latter, the record is the evidence for the Anthropocene. The older Anthropocene would appear to be more favorable for archaeology. However, temporal and spatial variability of human impacts on the environment is often minimized. Evaluating the relationship between archaeology and the Anthropocene provides an opportunity to discuss with students wide-ranging concepts such as unit construction, the archaeological record as repeated experiments, the role of variation in evolution, and the philosophy of the human-nature dichotomy.

Nagaoka, Takuya [100] see Ono, Rintaro

Nakatsuka, Nathan (Harvard Medical School), Vera Tiesler (Universidad Autónoma de Yucatán), Jakob Sedig (Harvard Medical School), Douglas Price (University of Wisconsin, Madison) and David Reich (Harvard Medical School)
[173]

Ancient DNA from Campeche, Mexico, Reveals a Socially Segregated Population in the First Two Centuries after Hispanic Contact

The Spanish Colonial period was an unprecedented time in Mexican history, when previously disparate populations began living together under Hispanic leadership and Catholic faith, often unwillingly. Spanish colonists established urban strongholds in the native territories, often bringing African slaves and servants with them. In these settlements, Native, European, and African populations intermixed for the first time. We present ancient DNA data from 10 individuals buried in the multiethnic cemetery of the central plaza of Campeche, Mexico, which was used between 1540 and 1680. In combination with archaeological, biomorphological, and isotopic data, aDNA provides a collective life history, which mirrors the diverse proveniences, living conditions and deaths of Hispanic founder generations. Although buried together in the same Catholic churchyard, the combined insights into the population affinities and lives of the deceased reveal a high degree of social segregation. We conclude that the mixing across continental groups may not have been as ubiquitous within early colonial Spanish strongholds as historically held, and became common only later in time. Also of methodological note is the excellent DNA acquisition from petrous portions, which despite the advanced disintegration of this tropical skeletal assemblage reached high genomic yields.

Nakatsuka, Nathan [173] see Nores, Rodrigo

Napolitano, Matthew (University of Oregon), Scott Fitzpatrick (University of Oregon), Geoffrey Clark (Australian National University), Esther Mietes (D7 Archeologie) and Amy Gusick (Natural History Museum of Los Angeles County)

[100]

Clarifying the Evidence for Early Settlement in Southern Yap, Western Caroline Islands

The initial human settlement of Yap, a group of four small islands in western Micronesia, is one of the least understood colonization events in Remote Oceania. Unlike Polynesia, where multiple lines of evidence such as linguistics, genetics, and material culture analyses coalesce around a coherent narrative of initial colonization, these same lines of evidence have resulted in major discrepancies that place colonization between 3300–2200 years ago with a possible homeland originating from somewhere in Island Southeast Asia or New Guinea and/or the Bismarck Archipelago as Lapita culture was developing. A clear understanding of Yap's early settlement has been hampered by a lack of systematic archaeological fieldwork and limited geomorphological reconstruction, making it difficult to model where early sites may have been located. Here we present results of systematic subsurface survey, excavation, preliminary paleoenvironmental and geomorphological reconstructions, and nearly 40 new cultural and non-cultural radiocarbon dates that shed new light on evidence for the earliest known settlement in Yap.

[100]

Chair

Napolitano, Matthew [135] see Hanna, Jonathan

Napora, Katharine (University of Georgia), Victor Thompson (University of Georgia), Robert Speakman (University of Georgia), Alexander Cherkinsky (University of Georgia) and Robert Horan (Georgia Department of Natural Resources)

[231]

Ancient Trees and Modern Seas: Toward Operationalizing Paleoenvironmental and Archaeological Data from the U.S. Southeast to Improve Twenty-First-Century Resource Management and Climate Change Policy

Deep-time data has the potential to greatly improve our preparations for the widespread effects of climate change in coastal regions. In this paper, we discuss how the paleoenvironmental and archaeological results of our multimillennial tree-ring-based analysis of ecological fluctuation and cultural resilience on the Georgia Coast may be able to be employed for climate change policy and resource management in the twenty-first century.

Narasimhan, Vagheesh (Harvard Medical School)

[173]

Understanding Natural Selection in Humans from Time Series Data

A key question in the study of human population history, is to understand how phenotypic traits respond to changes in selective pressures and evolve over time. By combining data from the ancient DNA record, tracking the frequency of alleles through both time and space and obtaining information from modern medical studies detailing the genetic basis of both monogenic and polygenic traits, we can examine the role natural selection has had in shaping the genomes of modern humans. Using a dataset comprised of ancient DNA from humans in Europe over the past 10,000 years, we examined how cultural transformations such as the transition from hunting and gathering to food production impacted the genomes of ancient humans, particularly in regions associated with immune response and metabolic changes thought to be affected by changes in diet. We also examined changes in polygenic risk for anthropometric traits whose phenotype can be directly assessed from the archeological record to get a better understanding of how both the genotype and phenotype of ancient humans changed with time leading up to the present day.

Nash, Brendan (University of Michigan), Michael Rivera (University of Texas, Arlington) and Miranda Berry (University of Texas, Arlington)

[37]

Analysis of the Late Archaic Lithic Assemblage from Way Ranch

A late Archaic occupation at Way Ranch way was identified in two areas near the proximal end of the floodplain on the outside of a bend in the Blanco River near San Marcos Texas. Both areas contained formal tools and manufacturing debris, and one contained a burnt rock midden. Projectile point styles recovered from the two areas have been dated to end of the late archaic at other sites in Texas. In one area, points above and within the midden more often have concave bases, while points below the midden, convex base points occur at a higher rate. As well as identifying a distinct style shift, the lithic material recovered from the two areas can inform us about site function; the fracture patterns exhibited by the projectile points combined with the large amount of late stage debitage indicates that this was, at least partly, a re-tooling camp.

Nash, Carole (Geographic Science, James Madison University)

[9]

Prioritizing What We Don't Know: Climate Change as a Catalyst for Upland Survey

The upland forests of the Appalachians are among the most diverse natural communities in the temperate world, providing the setting for a study of change and flexibility as an essential feature of existence, both for pre-contact and historic cultures. However, upland archaeology has lagged due to the long-held belief that upland sites have limited signatures and are thereby less likely to provide significant information on cultural processes. Currently, archaeological sites here are compromised by climate change processes such as drought and high winds that create conditions for frequent wildfires, as well as extreme precipitation events that lead to severe erosion, flash flooding, or rapid mass wasting. The lack of research makes it difficult for decision-makers to develop prioritization plans in the face such threats. A GIS-based analysis of settings that are most likely be impacted by catastrophic

climate-related events, coupled with archaeological models of pre-contact site locations, provides a process for identifying areas in the greatest need of survey. Such work is being carried out in Shenandoah National Park, where archaeologists ground truth the geospatial analysis to further refine decision-making for future work.

[9]

Chair

Nash, Carole (Geographic Science, James Madison University)

[220]

Discussant

Nash, Donna (UNCG)

[260]

Postcolonial Moquegua: The Long-Term Impacts of Wari Imperialism

Long-lived empires such as the Wari polity have enduring effects on the regions they subjugate. The withdrawal, collapse, or overthrow of a colonial state does not result in a return to pre-imperial lifeways, political relations, or religious rationales for power relations. In the past, many scholars have attributed the features of early LIP groups in the Moquegua drainage to Tiwanaku while ignoring the substantial way that Wari colonists transformed the landscape of the upper drainage and the impact of interpersonal relations between Wari state agents and local groups on the coast, middle valley, and highland grazing areas (all ecozones from which Wari settlers drew resources). The sustained Wari presence in Moquegua for more than three centuries undoubtedly changed the valley and its inhabitants forever. In this paper I examine the legacy of Wari colonial institutions in Moquegua from the perspective of the political economy and document how Wari political and ritual practice were maintained or rejected in the subsequent Late Intermediate Period.

[260]

Chair

Nash, Donna [242] see Blackman, David

Nash, Donna [5] see Wieland, Spencer

Nash, Donna [86] see Williams, Ryan

Nash, Donna [260] see Witte, Emilee

Nash, Steve [156] see Baxter, Erin

Nauman, Alissa [5] see Pike, Sabrina

Navarro-Farr, Olivia (The College of Wooster)

[209]

Moderator

Navarro-Farr, Olivia [223] see Freidel, David

Navarro-Farr, Olivia [5] see Hulen, Cyrus

Navarro-Farr, Olivia [213] see Rolph, Kevin

Navas, Ana (University of Texas, Austin)

[39]

Compositional and Technological Analysis of Panamanian Colonial Utilitarian Wares

In Panama, as in other regions of the Caribbean and Latin America, several archaeologists have reported the presence of colonial utilitarian wares, also known as colono-Indian ware, creole ware, and coarse hand-made earthenware. Previous research on this ware focuses on refining the typologies and identifying traits that could be related to African, Spanish, and Indigenous traditions. Inspired on recent research that approaches production and consumption of colonial technologies as contextually constructed, I study the configuration of new communities of practice for the production of pottery in colonial Panama. Compositional and technological analysis through neutron activation and petrographic methods of 192 sherds from Central and Eastern Panama inform the recipes and techniques used for ceramic production during the precolumbian and colonial periods. This study provides new data to address the production and consumption of Panamanian colonial utilitarian wares beyond the identification of identity and definition of typologies, and new insights to understand the contribution of non-Europeans to the construction of colonial Panama.

Naveros Guizado, Marco Antonio [224] see Black, Valda

Nebbia, Marco

[48]

Trypillia Mega-Site Networks: Understanding the Centrality of the Largest Settlement in Fourth Millennium BC Europe

The emergence of the largest settlements in fourth millennium BC Europe triggered a number of questions regarding their proto- or even 'fully urban' nature. For long time scholars have been debating on this matter focusing the attention on the intrasite features of Trypillia mega-sites, thus overseeing the implication of understanding how they originated within a long-term settlement trajectory.

This paper will look at the role of the Trypillia settlement network in the development of mega-sites as poly-nodes of mid-scale regional site clusters as well as 'central places' of a supra-regional settlement system. First and second order characteristics of point pattern analysis are investigated in order to propose a way of measuring the centrality of these mega-sites within their coeval settlement network, as well as understanding the scale of their hinterlands. Concepts like seasonality and heterarchy are used to explain the development and the social organization of mega-sites, which are conceived as temporary gathering places where an 'urban-like' identity starts to develop. The relational nature of the proposed approach could facilitate its applicability to other regional contexts which would allow for a more formal cross-regional comparison of long-term settlement trajectories.

[48]

Chair

Neeley, Michael (Montana State University) and Josh Chase (Bureau of Land Management)

[186]

Revisiting the Henry Smith Site: New Work at a Late Prehistoric Site in the Northwestern Plains

The Henry Smith site (24PH794), a late prehistoric bison kill with associated drive lines, cairns, and effigy figures, first gained notoriety in the late 1970s with the seizure of illicitly obtained artifact collections from local artifact collectors. As part of the subsequent mitigation process, the Bureau of Land Management conducted limited testing and mapping of the site to assess the damage, remaining potential, and integrity of the site. Following a long hiatus, the BLM and Montana State University initiated renewed investigation of the site complex in 2016–17. Early on, it became apparent that the site was even more extensive than originally reported and constituted an engineered landscape, with diverse feature types and activities intertwined across the landscape representing a long time span. This poster presents the results of the renewed work through the combined use of excavation, aerial survey, and mapping. Our results indicate a varied, complex, and repeated use of the landscape over the past 1500 years.

Neff, Hector (California State University, Long Beach), Clifford Brown (Florida Atlantic University) and Kelsey Willis (Florida Atlantic University)

[126]

NAA Evidence for Extension of the Providencia-Miraflores Interaction Sphere into Northwestern Nicaragua

The Cosigüina Ceramic Complex, recognized recently in excavated Late Formative samples from Chinandega, northwestern Pacific Nicaragua, shows close typological similarities with the Providencia and Miraflores Spheres of southeastern Guatemala and western El Salvador. Usulután, Fine Red, Polished Black-Brown, and other decorative categories are close enough in some cases to merit use of the same type names used farther west. The typological similarities presumably could have arisen through direct importation of vessels, faithful replication of production practices, or a combination of the two. In order to investigate these possibilities and to develop a baseline of local ceramic compositional profiles, 200 ceramic pastes were recently analyzed by neutron activation analysis. While the vast majority fall into two presumed local compositional groups, a smaller subset diverge from Nicaraguan profiles and instead show compositions similar to groups from western El Salvador and southeastern Pacific Guatemala.

[126]

Chair

Neff, Hector (California State University-Long Beach)

[237]

Discussant

Neff, Hector [237] see Daniels, James

Neff, Linda

[254]

Transforming Archaeological Learning into Action: Service Learning as a Teaching Strategy

A popular watering hole throughout history and prehistory, Turkey Tanks is small basalt canyon that was home to Flagstaff's earliest settlers. The canyon landscape is also the focal point for a service learning project designed for anthropology undergraduate students and local CRM technicians to learn survey methods within the context of a meaningful project for the U.S. Forest Service Flagstaff Ranger District. Distinguishing it from a community service project where there is typically a large amount of service with little or no learning, the service learning model combines a large amount of service with a large amount of learning. The long-term service goal is to identify and evaluate the potential boundaries of an archaeological district for a National Register of Historic Places archaeological district nomination. Through a series of small projects, participants learn artifact analysis through Forest Service-sponsored workshops and then apply and commit to volunteer survey work where they learn how to identify and record archaeological sites. While the survey area has provided a retreat for many visitors throughout time, this canyon continues to benefit students and the community in a long-term campaign to solve a problem that establishes this important local as a part of our national memory.

Neff, Matthew, Rachel Channell and Lawrence Todd (GRSLE)

[65]

A Post-fire Archaeological Assessment, Documentation, and Monitoring Protocol: Greater Yellowstone Ecosystem, Wyoming

Large, intense wildland fires in the twenty-first century have presented Rocky Mountain archaeologists with opportunities and challenges. Little to no archaeological inventory has been conducted in many montane environments and the materials exposed post-fire often provide the first glimpse into the prehistoric archaeological record of these vast areas. While destruction of wooden structures can be part of such fires, a more common impact is to the near-surface archaeological record; once exposed it is

susceptible to a variety of threats including looting, rapid deterioration of organic materials, trampling, and erosion. Changes in climate are likely to increase the occurrence and intensity of wildland fires across North America, challenging researchers and resource managers with unprecedented problems. Using examples from Shoshone National Forest, NW Wyoming, a multi-year program is described that includes: 1) rapid, post-fire initial assessment and planning, 2) intensive survey and surface archaeological documentation, 3) implementing coupled field methods that incorporate ancillary data capture such as burn intensity, thermal alteration, trampling alteration, and erosional changes as part of the archaeological work, and 4) long-term, post-fire monitoring.

Negash, Agazi [249] see Kappelman, John

Negrino, Fabio [38] see Keller, Hannah

Neiman, Fraser [98] see Galle, Jillian

Neitzel, Jill (University of Delaware)
[229]

Entangled Stories of the Magician's Burial

The biography of the Sinagua man interred at one of the U.S. Southwest's most well-known Ancestral burials encompasses multiple, intersecting stories. At the center is the singular life of the person known today as the "Magician", who was born around AD 1130–1135 and died around AD 1175 at the site of Ridge Ruin in north-central Arizona. But the Magician's stories extend for more than a millennium beyond this 40–45 year span. Key developments in this expanded time frame include: 1) the archaeological discovery, excavation, and documentation of the Magician's physical remains and grave goods; 2) a period of stasis during which some archaeologists assessed his published data and significance; 3) documentation and reassessment as part of Forest Service compliance with the Native American Graves Protection and Repatriation Act (NAGPRA); and 4) reburial by the culturally affiliated Hopi Tribe. During each of these stages, shifting sets of individuals with different cultural and institutional affiliations affected what happened to the Magician. Together, their entangled histories comprise a roughly 1,000-year cycle in which the final act once again laid the Magician to rest.

Neller, Angela (Wanapum Heritage Center, Grant County PUD) and Lourdes Henebry-DeLeon (Central Washington University)

[49]

The Time Is Now: Ethics, Inclusivity, and Relationships in Archaeological Practice

The time is now for ethical practices in archaeological interpretation. Building relationships with Native American descendent communities offer opportunities for inclusive partnerships that can change the framework of archaeological practice. Any project involving collections associated with descendant communities should include those communities as equal partners. Archaeological collections are tangible, nonrenewable resources that connect descendent communities to their history. There are archaeologists who work with descendent communities but for many NAGPRA can be the starting point. You can stop upon completion of your NAGPRA requirements or you can take what you learned and move beyond it to an ethical practice of inclusivity. Divisiveness in archaeology will continue if it remains a field of work that is largely disrespectful and insensitive to tribal concerns and beliefs. Isn't it discouraging that after thirty years since the passage of NAGPRA, archaeologists and tribes are not equal partners and colleagues in the practice of archaeology?

Neller, Angela (Wanapum Heritage Center, Grant County PUD)

[96]

Discussant

Neller, Angela [49] see Henebry-DeLeon, Lourdes

Nelson, Erin (University of South Alabama), Jessica Kowalski (University of South Alabama) and Howard Cyr (University of Tennessee)

[222]

Landscape Change at D'Olive Creek, a Pensacola Culture Site in Lower Alabama

Geoarchaeology and excavation within the southeastern portion of the D'Olive Creek site (1BA251) indicate Native American occupation of the site was contemporaneous with extreme weather events. In portions of the site, thick deposits of wind-blown sand separate midden accumulations along the creek banks. This paper explores: 1.) landscape change at D'Olive Creek resulting from extreme storm events, and 2.) the ways in which Pensacola culture people interacted with the changing landscape of the site.

Nelson, Shaun (Utah National Guard), Ephriam Dickson (National Park Service) and Jane Stone (Independent Museums Professional)

[52]

Camp Floyd: Cornerstone of Utah's Military Cultural Landscape

In 1857, 2,500 soldiers under the command of Colonel Albert Sydney Johnston entered Utah to suppress the "Mormon Rebellion." Johnston's soldiers established a permanent military post southwest of Salt Lake City known as Camp Floyd. It would become the

largest military post west of the Mississippi and influence the regional economy and culture. In 2009, the Fort Douglas Museum, Utah National Guard, and Camp Floyd State Park formed a partnership to conduct excavations on the site. The results are summarized in a final report, and have broad implications for the future management of this important site.

Neme, Gustavo, Adolfo Gil (IDEVEA/CONICET), Christopher Morgan (University of Nevada, Reno), Miguel Giardina (IDEVEA/CONICET) and David Harvey (University of Nevada, Reno)
[243]

Human Occupation at High Elevations: Excavations at the El Indígena Archaeological Site

The human occupation of high elevation environments has a long history in archaeological research around the world. In the southern Andes between 34° and 35° SL, several archaeological sites were recorded above 3000 masl, referred to as Aldeas de altura (high elevation villages). These are characterized by the presence of rock habitational structures, high ceramic density and occupations dated during the last 2000 years. At 3300 masl, El Indígena site is among the larger concentrations of hunter gatherer habitational structures in southern Andes and contains 136 ring stones in the main cluster. With its discovery in 1972 the site caught the attention of many archaeologists from Argentina and Chile. However due to the challenging location very limited field work has occurred at the site. For this reason, many of the questions persist and the debate about its origin and function are still open. In this paper we communicate the results of the recent fieldwork at the El Indígena site, present the new radiocarbon dates, and include the site in the regional archaeological debate.

Neme, Gustavo [15] see Morgan, Christopher

Nesbitt, Jason [5] see Johnson, Rachel

Netherly, Patricia (Vanderbilt University) and Tom Dillehay (Vanderbilt University)
[23]

The South American "Archaic": Terms, Transformations, and Pathways

The so-called "Archaic" or "Pre-ceramic" period can be understood as a stage with distinctly new lifeways. In South America and especially in the Central Andes, this roughly 6,000-year period extends from the terminal Pleistocene to the Middle Holocene. It is understandably different, both spatially between different environments and temporally involving socio-economic changes and developments of different local communities across the continent. In the Central Andes, there were different pathways to the Archaic and multiple origins of its constitutive processes, namely sedentism, domestication of plants and animals, initial urbanism, and social complexity (equality and inequality). However, despite these differences, the different pathways have a number of distinct elements of universal value and interest. The transformation of these constituent pathways and processes created the necessary conditions for developing permanent communities and provided the foundations for urban society and political complexity in Andean, northern and eastern South America.

Neto, Manuel [11] see Matos, Daniela

Neuhoff-Malorzo, Patricia
[53]

New Geophysical Survey Data from Tzak Naab

Construction of buildings in ancient Maya culture is often infused with ritualistic aspects of culture and belief. This is generally discussed with respect to deposits unearthed during excavation. These ritual manifestations in construction and building specifics can also reflect either changes or continuities in social and economic allegiances. Evidence for these shifting alliances can be found by examining spatial patterns. This presentation will focus on the spatial data gathered from the Maya site of Tzak Naab. Specifically, how the differences in the geophysical data, often reflecting changes in architectural trends, can also indicate modification in social and economic connections.

Neuman, Amy [192] see Weber, June

Neumann, Frank [11] see Val, Aurore

Neves, Eduardo (University of São Paulo)
[161]

Discussant

Neville, Holly (University at Albany, SUNY)
[178]

Glyph Block Organization in Classic Period Palenque Texts

Monumental architecture in Classic period Maya polities often contained hieroglyphic passages carved into their surfaces. These passages were planned and executed with glyphs arranged in glyph blocks, which took on many different organizational patterns. At the Classic period site of Palenque, there are glyph blocks with widely varying concentrations of glyphs, anywhere from two to

twelve glyphs comprising a single block. This poster will analyze the arrangement of individual glyphs into blocks, as well as their orientations with regard to main glyphs and syllabic morpheme glyphs.

Newell, Savannah (Indiana University) and Jonathan Karty (Indiana University Bloomington, Mass Spectrometry)

[169]

Up in Smoke: Detection of Tobacco Use in Skeletal Remains from the Prehistoric Midwest

North American research on tobacco in prehistory has largely focused on pipes and residues, paleoethnobotanical remains, and historical inferences. This project determines individual tobacco use by detecting nicotine in human skeletal remains from the Midwest. Archaeological rib samples were taken from 50 adult individuals (27 females, 22 males, and 1 indeterminate) representing five Illinois sites spanning from the Middle Woodland to Mississippian time periods (~2000 BP to 500 BP). Modern samples (n=3) were added to the study for comparative analysis. Nicotine and cotinine, nicotine's primary metabolite, were extracted and detected using liquid chromatography-tandem mass spectrometry. Nonparametric tests showed that there was no significant difference between individuals buried with pipe and those without (n=0.765) and between males and females (p=0.185). There is a significant difference in nicotine content based on age (p=0.035), time period (p=0.033), and site (p=0.039). Overall, and perhaps unsurprisingly, those individuals of older age show higher levels of nicotine. Interpretations based on site are difficult because several sites have samples from fewer than five individuals. The mean nicotine content from Late Woodland is nearly twice that of both Mississippian and Middle Woodland, suggesting smoking practices distinct from both earlier and later components.

Newell, Zachary (Center for Study of the First Americans, Texas A&M), Andrew Robbins (Texas A&M University), Michael Moreno (Texas A&M University), Morgan Smith (Social, Cultural, and Justice Studies Department,) and Ji-Wan Han (Texas A&M University)

[147]

Digital Excavation of Osseous and Lithic Artifacts Embedded in Bone

Osseous and lithic projectile points used in hunting often impact bone and sometimes the point tips become embedded in the bone. We obtained high resolution CT scans of the osseous tip fragments in the rib of a mastodon at the Manis Site, Washington, as well as a lithic point tip fragment embedded in the skull of the Alexon Bison, Florida. We used open source medical imaging software, 3D Slicer, to digitally excavate and create models of these osseous and stone projectile fragments. This noninvasive technique allows us to use 3D modeling programs to refit the fragments and digitally reconstruct the original forms of the points. Physical models of the embedded points are then created by 3D printers.

Newitz, Annalee (New York Times)

[70]

Discussant

Newland, Michael and Alex DeGeorgey (Alta Archaeological Consulting)

[221]

Human Remains Recovery in Wildfire Disaster Areas

The Camp Fire was the deadliest and most destructive wildfire in California history burning over 18,800 structures and destroying the town of Paradise. In many instances, the cremated remains of previously deceased family members were stored within the home. A volunteer group of archaeologists and canine forensic teams banded together to recover remains lost during the firestorm. This paper tells the story of our recovery effort and describes how archaeology can be used to help those affected by natural disaster. This effort represents a new application for archaeology.

Newlander, Khori (Kutztown University)

[30]

Sourcing Chert Artifacts in East-Central Pennsylvania

In Pennsylvania, archaeologists have long sourced chert artifacts back to their geographic-geologic origin based on the visual analysis of macroscopic attributes. On this basis, archaeologists have documented the movement of stone over enormous distances, defining vast territories or trade networks that stretch across much of the Middle Atlantic region. But is it really that simple? While our colleagues in other regions subject their chert artifacts to microscopic and chemical analyses to determine from where they originated, are we in Pennsylvania lucky because our rocks are "easy"? Probably not. Focusing on a Late Archaic-Early Woodland site in east-central Pennsylvania, I explore some of the challenges of sourcing chert artifacts in the region. In particular, I note the necessity of determining the intra-source variability that exists in chert quarries across the region as a first step for confidently sourcing chert artifacts and interpreting their conveyance.

Newman, Richard (Museum of Fine Arts, Boston) and Emily Kaplan (National Museum of the American Indian)

[258]

Characterization of the Binder Used for Late Intermediate Period Ica Painted Wooden Boards

Wooden objects excavated by Uhle and others from LIP sites in Ica, Peru have been identified variously as guara boards for watercraft and ceremonialized agricultural implements. Leaving aside the function and meaning of these objects for the moment, these oversized wooden objects are often elaborately carved and decorated with paint, metal sheet and pins, and sometimes feathers. The binder used for the paint has not to date been identified. As part of a larger study to identify plant resins used as paint binders in the pre-colonial and colonial Andes, we compare paint samples from these "boards" with a group of likely plant exudates and results from analysis of other painted Andean objects including colonial wooden drinking cups called qeros.

Newsom, Bonnie [9] see Kelley, Alice

Newton, Kathryn, Paige Ford (University of Oklahoma), Meghan Dudley (University of Oklahoma), Sarah Luthman (University of Oklahoma) and Delaney Cooley (University of Oklahoma)
[97]

Oklahoma Public Archaeology Network (OKPAN) Engagement and Collaboration with Oklahoma Tribal Nations

Since its inception in 2017, the Oklahoma Public Archaeology Network (OKPAN) has strived to foster relationships with each of the thirty-nine tribal nations in Oklahoma. As an organization, we attempt to bridge traditional archaeological interests with contemporary Native concerns and perspectives. Our organization seeks to engage and collaborate with tribes through the development of K-12 curriculum, classroom visits, community days, research investigating the earliest occupations in Oklahoma, cultural resource management, as well as other forms of public outreach. In this paper we briefly discuss the successes and challenges of these endeavors and introduce our nascent "Tribal Collaboration Forum Series." The series emphasizes the diverse perspectives of descendant communities to bridge gaps in communication and outreach between stewards of the past in Oklahoma and beyond.

Nguyen, Ai Du [100] see Weisler, Marshall

NH, DHR (New Hampshire Division of Historical Resources) and Mark Doperalski
[190]

Surveying New Hampshire's State Reservations: Maximizing the Benefits of Public Archaeology

Archaeological resources on state-owned lands belong to the people. Agencies managing these lands are obliged to be good stewards of these archaeological resources on behalf of the citizens. Unfortunately, funding is often not commensurate with the mission at hand; and as a result, the stewardship of such resources is not always what might be desired. A recent emphasis, by the New Hampshire Division of Historical Resources, on completing state-sponsored archaeological field schools and volunteer-based surveys on state-owned lands is maximizing efforts directed toward teaching archaeological field methods and increasing public awareness by also directly contributing to the inventory, documentation, and management of archaeological deposits on state-owned lands in New Hampshire. Investigations such as these are contributing interpretive data that can be used by state land managers in the creation of interpretive displays to be placed in park facilities and signage to adorn trail systems, campsites, and other recreational areas as well as inform interpretive programming. Newly informed interpretive displays, signage, and programming not only create more interest in, and awareness of, archaeological resources on state-owned lands, but also aid land managing agencies in providing outstanding educational and inspirational experiences that in turn are likely to increase visitor attendance and revenue.

Nichols, Deborah (Dartmouth College)
[54]

Discussant

Nichols, Deborah (Dartmouth College), L. J. Gorenflo (Penn State) and Ian Robertson (ASU)
[102]

Basin of Mexico: Prehispanic Population History

The Basin of Mexico Survey and the Teotihuacan Mapping Project were landmark projects in the history of archaeology. One goal of both projects was reconstructing prehispanic population history to improve our understanding of cultural evolution in this region. The population histories and estimates generated for the great city of Teotihuacan and the Basin as a whole significantly changed our understanding of prehispanic Mesoamerica. The abandonment of many rural settlements in the Basin of Mexico at the time of Teotihuacan's dramatic growth in the first century AD had been unknown, as had the impact of the city's collapse on regional settlement and demographics, the geographic influence of Tula on Basin settlement, and the rapid growth of Aztec population. But those demographic reconstructions warrant revisiting. In this paper we discuss several factors that complicate demographic reconstruction in the Basin and at Teotihuacan, including challenges of surveying multicomponent sites, the need for refined ceramic chronology, difficulties in linking urban and rural demographics, limitations on surface visibility of sites due to the effects of erosion and deposition, effects of varying land use on surface remains, and the general challenge of establishing contemporaneity within and among sites.

Nichols, Deborah (Dartmouth College)
[152]

Discussant

Nichols, Deborah (Dartmouth College)
[181]

Discussant

Nichols, Deborah [5] see Johnson, April

Nichols, Kristi Miller (Alamo Trust Inc.)

[113]

Discussant

Nicodemus, Amy (University of Wisconsin, La Crosse)

[22]

Animal Economies and Emergent Complexity in the European Bronze Age

The Bronze Age is marked by dramatic social changes throughout much of the Old World. In Eastern Europe, and elsewhere, we see the emergence of regional hierarchies characterized by political and economic centralization and heightened status differentiation. While focus traditionally has been placed on the manufacture and exchange of metals, significant changes in livestock management systems can also be seen at this time. At central settlements, such as Pecica-Șanțul Mare (Romania), animal husbandry shifts from employing risk-buffering to resource-maximizing strategies, intensifying the production of high-value animals and their products. This, in part, reflects the desire to increase exportable commodities. Other changes are responses to local elite demands for high-quality meat, including the implementation of provisioning systems and ritualized feasting. Restructuring of animal production and consumption practices is tightly integrated within, and central to, broader economic changes that lay the foundation for complex polities in the European Bronze Age.

Nicolas Lorenzo, Dennis (National Pedro Ruiz Gallo University)

[182]

De la costa a la Amazonia: Un estudio sobre las rutas de interacción multirregional del Periodo Formativo Medio y Tardío en el Norte del Perú.

El objetivo principal de esta investigación consistió en identificar y definir las rutas de interacción multirregional utilizadas durante el periodo formativo medio y tardío (1200-550 aC) entre la costa norte y la región amazónica en el norte del Perú, destacando la localización de asentamiento con arquitectura e iconografía de este periodo en la zona altoandina de Lambayeque (Kaňaris e Inkawasi). La zona altoandina de Lambayeque se localiza en una región intermedia que conecta la costa de Lambayeque con la región amazónica. En esta región, para el periodo formativo medio las rutas se definieron mediante la localización de petroglifos y pequeñas plataformas rectangulares en la parte media y alta de las cuencas, mientras que para el formativo tardío se observa un incremento notable de sitios con arquitectura, y la ruta se define por sobre las cordilleras. Finalmente, mediante el análisis GIS, se infiere que el cambio sucedido entorno a la localización de las rutas del formativo medio al tardío está relacionado por el costo de viaje y a la intensificación de las relaciones multirregionales en la región, relacionado al fenómeno chavín en los andes centrales entre el 800 y 550 a.C.

Nicolay, Scott (University of California, Merced)

[137]

"Tlaloc" and "Chicomoztoc" in the North: Evidence for Chthonic Concepts from Mesoamerican Cosmvision in the Caves of the Greater Southwest

Claims for contact between Mesoamerica and the North American Southwest predate by centuries the inception of archaeology as a scientific discipline. However, despite such long-standing assumptions and the accumulation of evidence from the archaeological record, including ball courts, copper crotals, cacao, and macaws, as well as material manifestations of Mesoamerican ideologies, the timelines, sources, and mechanisms for these transmissions remain elusive. One of the most dramatic (if controversial) indicators for long-distance contact is the presence of the Mesoamerican storm god known in Nahuatl as Tlaloc in hundreds of images in rock art from New Mexico, Texas, Chihuahua, and Sonora, as well as on portable objects, including ceramics and painted effigies from at least five caves. Two other Southwestern caves, both among the most important cave shrines in the region and at least one of which has been culturally modified, present unusual morphologies suggesting that they may have functioned as representations of Chicomoztoc, the Nahua "seven caves" of emergence. This paper presents new findings for both concepts and reconsiders their presence in the Southwest as well as the timing of their arrivals, suggesting that while Tlaloc may have arrived centuries earlier than previously recognized, the Chicomoztoc model may be even older there.

Nielsen, Anna [235] see Habu, Junko

Nielsen, Christina, Jen Anderson (TxDOT) and Kevin Hanselka (TxDOT)

[186]

TxDOT Excavations at the Hardeman Midden Site (41DN612)

From April through June 2019, a team of TxDOT and SWCA archeologists excavated the Hardeman Midden site (41DN12) in Denton County. The site lies on a terrace of Denton Creek and consists of a burned rock sheet midden (a site type not common in this area) with an intrusive historic refuse component. Preliminary geoarcheological analyses identified five strata at the site. The midden occurs in Stratum III, correlating with the West Fork soil which dates to within the last 2,000 years (Late Archaic to Late Prehistoric periods). Six other burned rock features were identified in underlying cultural horizons interpreted to encompass the last 4,000 years (Middle to Late Archaic periods). Besides burned rock, the most abundant materials encountered were mussel shell and faunal remains. No lithics were recovered. Given the site's stratigraphic integrity, ongoing investigations will focus on identifying isolable components and include geoarcheological, artifact, feature, faunal, and macrobotanical analyses.

Nielsen, Christina [176] see Cody, Mercedes

Nielsen-Grimm, Glenna and Richard Hansen**[163]***Excavations on El Leon*

Preliminary testing of the structure identified as El Leon, at the site of El Mirador have determined that the latest additions to the structure are probably late preclassic, with the central construction dating to the Middle Preclassic. Evidence suggests that this area of the site, the Central Plaza, is an early ritual center. El Leon is the western building of an E group.

Nieves, Ana (Northeastern Illinois University)**[141]***Body Quilcas: Tattooing and Body Painting in Ancient Peru*

Terence Grieder's studies of the artistic traditions of the ancient Americas resulted in thorough descriptions of form, style, and manufacturing techniques. But his work went beyond the descriptive as he did not shy away from the discussion of meaning and symbolism, for which he relied on ethnographic analogy. With the understanding that art is a semantic system, Grieder's comprehensive approach allowed him to address both the system and the content, combining his observations and data with a more speculative interpretive approach. In an effort to discuss both system and content, this paper focuses on the images depicted on the bodies of larger figures in Andean ceramics, particularly those of the Nasca civilization. Are these images representations of body painting and/or tattooing, or are they strictly symbolic forms? Casting a wide net in order to discuss the significance of these images, I integrate various lines of evidence, starting with the objects themselves. I also address the physical evidence of tattooing and body painting in the Andean region. Comparisons to both local and distant practices, as well as a discussion of relevant Andean concepts, also help us understand these images.

Nikitina, Daria [9] see Wholey, Heather

Nims, Reno (University of Auckland)**[262]***Methods and Ethics for Data Reuse: A Zooarchaeological Case Study from Aotearoa New Zealand*

Legacy zooarchaeological datasets are regularly collated to construct regional understandings of human-environment interactions in the past, but they are often systematically biased by recovery and identification methods, undermining the validity of archaeological interpretations. In Aotearoa New Zealand, few assemblages of animal remains have been collected with fishbone analysis in mind, and previous work based on legacy assemblages may seriously misrepresent the actual nature and range of traditional Māori fisheries. Because such archaeological claims have real-world consequences for historically oppressed descent communities, archaeologists should critically and transparently evaluate the quality of all data we use to construct such knowledge, especially for datasets that are perceived as foundational. Archaeologists should also consider consulting descent communities in accordance with principles of indigenous data sovereignty before reusing data or reanalyzing legacy collections, just as we would prior to beginning new excavations. This paper summarizes a recent project from northern Aotearoa New Zealand based on legacy fishbone assemblages, presents methods for assessing data quality in comparative studies, and considers the ethics of data reuse.

Nina Vargas, Hortensia [4] see Capriles, José

Niquette, Charles (Cultural Resource Analysts Inc.)**[58]***The Founding of Cultural Resource Analysts Inc.*

Cultural Resource Analysts (CRA) was founded out of necessity when my previous employer filed Chapter 11. CRA grew through entrepreneurial desire, wisdom guided by experience, and trust in the expertise of others. Starting out as a one-man company that could only do prehistoric archaeology in a very small region of the country, CRA has been transformed into a one stop shop for nearly any kind of historic preservation requirement. Our success has been our people, their expertise, and a collaborative effort to provide exceptional research results and, most importantly, to our continued success, customer satisfaction. Today, CRA offers all aspects of historic preservation services (except underwater archaeology) to our clients.

Niquette, Richard (University of Kansas), Bryon Schroeder (Center for Big Bend Studies of Sul Ross State Univ) and Rolfe Mandel (Kansas Geological Survey)**[8]***Preliminary Results of Geoarchaeological Investigations at the San Esteban Rockshelter (41PS20), Southwest Texas*

The San Esteban Rockshelter is located in the Alamito Creek drainage of the Big Bend region, southwest Texas. The site is associated with a perennial tinaja, which made it an attractive location for human occupation in this arid region for at least the past 10,000 years. The shelter has been subject to undocumented collecting since the early 1900s, yet preliminary testing in 2000 revealed intact cultural deposits. In the summer of 2019, the University of Kansas Odyssey Research Program launched a geoarchaeological investigation to determine the extent and age of sedimentary and cultural deposits in the shelter. Despite the magnitude of previous disturbances, the 2019 study revealed extensive intact cultural deposits dating from the late Holocene through the historic period. In addition, potential for older intact deposits is indicated by the recovery of mid-Holocene hafted bifaces retrieved from backfill. This poster presents the preliminary results of the 2019 investigation. Continued research at San Esteban will address many questions of past lifeways in southwest Texas.

Nishimura, Yoko (Gettysburg College)**[248]***Doing Archaeology Outside of the Trench: A Case Study from the Jōmon Period in Japan that Utilizes Museum "Diaspora" Collections for Research*

Archaeological research using old museum collections has continued to be an important topic to many. This paper presents a research method that goes beyond the practical, laboratory research that centers around the materials and technologies of the artifacts stored in museums. It offers an investigatory method of how to generate research questions that address broader sociocultural aspects in ancient societies and how to carry out the archaeology research by utilizing the uniqueness and strength of old museum collections. Such research necessitates the selection of artifacts that are informative on surface appearance and that can be linked, as a "diaspora" collection, to an "original" dataset in their homeland. Once the diaspora collection is embedded within its homeland dataset, it generates meaningful research questions and leads us to solid archaeological research. A case study is drawn from an enigmatic but ubiquitous pottery type, called irregular-shaped footed pots, that emerged and flourished during the Late Jōmon period (ca. 1700 BC~) in eastern Japan. The functional analysis of this particular pottery type is discussed.

[248]*Chair***Nissen, Zachary (Northwestern University)****[57]***"Vertical Roots": Inequality, Belonging, and Narratives of Place in Northern Belize*

For the people of contemporary Belize, issues of heritage and ancestry are often addressed in binary terms of long-term indigenous continuity or sharp Spanish and British colonial discontinuities, which involves designating specific social groups to discrete geographic locations. However, for ordinary people, these issues are deeply political and tied to complicated histories of forced movement, social inequality, and violence. For example, much of northernmost Belize is populated by peoples that sought refuge from the Caste War of Mexico's Yucatán Peninsula in the mid 1800s. This paper explores how some residents of San Joaquin Village, located near the archaeological site Aventura, Belize situate their coming to occupy the landscape through narrations of their shared experiences and histories of the landscape. Specifically, it examines the ways locals theorize their "vertical roots" and how it hones a sense of belonging to the landscape that is expressed through storytelling and everyday encounters with the archaeological space. I argue that this perspective offers a means of conceptualizing ways of being and living in postcolonial landscapes that can break down the harmful modes of thinking about heritage and history which situate people in linear histories of Spanish or Maya ancestry.

Noack Myers, Kelsey**[95]***Moderator***Noack Myers, Kelsey****[217]***Discussant***Noe, Sarah, Randy Haas (University of California, Davis) and Mark Aldenderfer (University of California, Merced)****[233]***From Hunting to Herding: A Preliminary Investigation of Camelid Domestication in the Lake Titicaca Basin*

As the sole large-bodied domesticated animal in South America, camelids constituted a primary component in Andean economies and social life, and were pivotal for the expansion of early complex societies. The timing and method of domestication, as well as the subsequent spread of husbandry practices, remains a fundamental question in Andean archaeology. This paper examines faunal remains from the following three well-dated sites in the Peruvian side of Lake Titicaca Basin located in the Andean highlands 3800m in elevation: Wilamaya Patjxa (9.0–6.5 ka), Soro Mik'aya Patjxa (8.0–6.5 ka), and Jiskairumoko (5.0–3.5 ka). Although the fragmentary assemblage is limited, a clear increase in camelid:deer remains is evident with camelids coming to dominate the late assemblage. This zooarchaeological analysis supports a hypothesis of camelid domestication in the Titicaca Basin by at least 3.5 ka. Future work aims to more precisely assess the timing of camelid domestication and provide a long-term perspective on the relationship between domestication, agricultural intensification, and the emergence of complexity.

Noël, Stéphane [76] see Guiry, Eric

Nolan, Kevin (AAL, Ball State University)**[97]***Discussant***Nolan, Kevin (AAL, Ball State University)****[231]***Archaeology and the Information Age: Entropy, Noise, Channel Capacity, and Information Potential in Section 106 Archaeological Significance Assessments*

Most archaeological fieldwork is conducted under the guise of evaluating impacts of federal undertakings on cultural resources. This public investment carries responsibility. CRM archaeologists determine which resources will be available for future study and which are unworthy of investigation. In practice, significance determinations are idiosyncratic and biased toward only portions of the

archaeological record. Where explicit justification is given in terms of the eligibility criteria, most sites are recommended under criterion D, information potential. Information and information potential are neither defined, nor consistently used. By conceptualizing the archaeological record as a noisy information channel, and archaeological observations as sampling a message from a source of unknown statistical structure, we get a formal definition of "Information Potential" that can be quantitatively assessed. Such a conception can guide strategies to understand the statistical structure of the archaeological record as observed. Employing Claude E. Shannon's (1948:395) concept of conditional entropy for a signal received through a noisy channel will result in a more systematic and scientific use of criterion D. This more explicit interpretation of information potential ensures public money will yield a more robust and more representative picture of the past. In this way, archaeology can finally join the information age.

Noldner, Lara (University of Iowa Office of the State Archaeologist) and Jennifer Mack (Univ. of Iowa Office of the State Archaeologist)

[172]

Documentation of NAGPRA Items at the University of Iowa Office of the State Archaeologist

The Bioarchaeology Program at the University of Iowa Office of the State Archaeologist (OSA) is currently working under a NAGPRA Consultation/Documentation Grant to determine whether there are additional NAGPRA items in the OSA's general collections. We have complete documentation of all human remains and associated funerary objects that are under the purview of the Bioarchaeology Program, but the OSA also has a substantial number of accessioned material from sites listed as mounds, prehistoric cemeteries, and villages. Artifacts from these contexts could potentially be considered unassociated funerary objects or sacred items, so they require a closer look. Through archival research we are identifying potential NAGPRA items and will also host a consultation event to get feedback from tribes on items we have identified, as well as their guidance in additional identifications and completing any summaries necessary. This presentation will be summary of our results to date, initial feedback from tribes (as our consultation event has not yet taken place), and challenging questions and issues we've encountered along the way.

Noldner, Lara [231] see Hawkins, Alan

Noll, Christopher (Archaeological and Historical Services, EWU) and Anna Coon (Archaeological and Historical Services, EWU)

[177]

An Examination of Notched Stone Line and Net Weight Design

In the interior Pacific Northwest, fishing during precontact times frequently involved the use of weighted nets or lines. The weights were produced from locally available cobbles, which were modified with chipped notches to aid in the attachment of the stones to fiber components of the fishing system. The weights appear to be expedient, low-investment tools; however few studies have investigated the design of notched net weights. The weights are critical to the success of the fishing system and may include design elements that reflect considerations of the application of the tools through selection of specific materials, and tool size and shape. This study provides an evaluation of the potential variables of stone net weights to identify attributes of the tools that may reflect functional design considerations in net weight production and use.

Nores, Rodrigo (Instituto de Antropología de Córdoba, Argentina [CONICET/UNC]), Nathan Nakatsuka (Harvard Medical School), Pierre Luisi (Universidad Nacional de Córdoba, Argentina), Josefina Motti (NEIPHPA-CONICET, UNICEN, Argentina) and David Reich (Harvard Medical School)

[173]

Genetic Change in South Patagonia over Seven Millennia

South Patagonia, the austral extreme of South America, has been inhabited for at least 12,500 years. Following European contact, five ethnic groups of hunter-gatherers (Yámana, Kawéskar, Selk'nam, Haush, and Aónikenk) were documented. They based their subsistence in two broad strategies optimized for maritime or terrestrial resources. After a century of fieldwork, archaeologists have revealed a complex pattern of differentiation between groups. Many questions regarding peopling, admixture, and technological changes remain to be answered. In order to provide some hints into those questions, we generated genome-wide data from 20 ancient individuals and compared it to previously reported data. We observed a shared genetic ancestry between maritime and terrestrial Middle Holocene individuals (~7300–6000 BP) that persists in some Late Holocene groups. We also identified two migration events that reached South Patagonia: a first wave by at least ~5000 BP that differentiated Late Holocene maritime groups from terrestrial ones; and gene flow with Central Chile around ~2000–1400 BP with major impact in terrestrial groups. Finally, Late Holocene groups fall on a genetic cline precisely correlated to geographic ordering following the coastal line, as a result of the uneven impact of these two migration processes.

Noriega, Aldo [21] see Conlee, Christina

Norman, Garth (ARCON Inc.)

[164]

260-Day Sacred Calendar at the Izapa Temple Observatory, Southern Mexico

The ancient Olmec 260-day sacred almanac is the most important intellectual construct in Mesoamerican civilization that governed nearly every aspect of life, believed to have originated at Izapa by at least 1600 BCE, seen on Monument 2, recorded through the four-quarter seasonal monuments of Izapa's astronomical observatory, and is most fully recorded on the twelfth month Stela 5 and new year carving on Stela 12. This Sacred Round has been explored most extensively by this author's Izapa and related projects over the past seven decades—with updated discoveries published in three recent books: 1) "Parowan Gap: Nature's Perfect Observatory" (2007); 2) "Izapa Sacred Space: Sculpture Calendar Codex" (2015); 3) "Cubit Connection in Ancient World Migrations"

(2018) and reported in SAA papers since 2006. The 260-day cycle was recorded and preserved in Izapa sculpture and architecture during Izapa's Late Formative heyday (600 BCE–200 AC). Its influence spread far and wide across Mesoamerica and beyond. It celebrates creation with the 9-month human gestation period and is coded in Izapa's calendrics which extends to the 26,000 year precession of the equinox. Wide range trade influence includes related calendar temple observatories at Teotihuacan, Mexico; Nazca, Peru; and Parowan Gap, Utah.

Norman, Scotti (University of Pittsburgh)

[32]

Discussant

Norman Brown, Lauren

[113]

Discussant

Norris, Austin (University of New Mexico), Hannah Mattson (University of New Mexico) and Joseph Birkmann (University of New Mexico)

[148]

An Experimental Examination of Lapidary Microdrill Use-Wear

Prehispanic archaeological sites in the Greater Southwest frequently contain objects of personal adornment, such as stone or shell beads and pendants. While many of these items are trade pieces, it is likely that a significant portion are the product of local lapidary production. Previous investigations of probable ornament workshop areas at sites across the Southwest indicate that lithic microdrills were an important component of the traditional lapidarist's tool kit. Microdrills were most often produced expediently from debitage and appear to be the principal tool used to create small perforations in hard materials. While experimental studies related to ornament manufacture have been conducted in the past, these primarily focus on labor/time expenditure or ornament microwear. Few studies have centered on the traces of lapidary production preserved on the tools themselves. Here we present the results of a comparative experimental study on microdrill use-wear associated with perforating a variety of materials, including those commonly used for personal adornment in the Southwest. It is hoped that this study will aid other researchers in identifying evidence of ornament production in flaked stone assemblages, including distinguishing between lapidary and other drilling activities.

Norton, Brandy

[233]

Snakes or Snacks? Prehistoric Diet and Possible Snake Consumption in the Lake Okeechobee Basin

This paper is a case study with a unique perspective on zooarchaeology. In recent years, it has become clear that it is necessary to approach zooarchaeology while utilizing new methods of interpretation of the data outside of, but not excluding, strictly numeric formulas. Standard zooarchaeological methods fail to take into account the preferences of people in the area being studied. Without other supporting evidence, the interpretation of numerical data can be somewhat questionable. In order to not impose European standards on past peoples, the field of zooarchaeology must create new methodologies, such as incorporation of oral histories, to account for these biases. For example, dense middens in the Lake Okeechobee basin in Florida often contain a large amount of snake bones. Understandably, many archaeologists have interpreted the presence of these bones as evidence of snake consumption by prehistoric inhabitants of the area. However, the Seminole Tribe of Florida (STOF) are descendants of these prehistoric inhabitants and snake consumption is taboo for the STOF. Oral histories suggest alternative possibilities for the presence of snakes in these middens. Based on the oral histories, examination of burning patterns and cutmarks on venomous versus non-venomous snakes could help determine if snakes were being eaten.

Nosie, Vanessa [184] see Castleberry, Cala

Novotny, Anna (Texas Tech University)

[99]

Souls in Flight: A Scioto Hopewell Ritual Drama about the Journey of Souls of the Deceased to an Afterlife

The association of the departing soul with birds in flight had considerable geographic and temporal range within the Eastern Woodlands. A bioarchaeological study of 89 photographs of skeletons, cremations, and isolated artifact deposits in Midwestern Hopewell and Adena charnel houses indicate that these were sometimes purposefully arranged into the forms of birds, bird-human composites, and other composite forms. The plot, characters, and choreography of the death drama performed in Charnel House C under Mound 25 in the Hopewell ceremonial center is detailed through an analysis of the layouts of skeletons and artifacts in tombs there and by reference to historic Woodland Indian lore about death journeys. Steps of the Hopewell journey include the release of the free soul from the deceased's head with the aid of a shamanic psychopomp, the soul's bird-like flight across the earth-disk, arrival of the soul at the waters at the edge of the disk, travel on the Milky Way path to a land of the dead, a helping hand across a barrier, a dangerous encounter with two raptors, and meeting a person in a fez-like headdress. Ritual dramas likely played a key role in creating and maintaining local and regional Hopewellian communities.

Novotny, Claire (Kenyon College) and Brett A. Houk (Texas Tech University)

[53]

Patolli and Ancient Maya Ritual Expression at Gallon Jug, Belize

Patolli game boards are found on plaster surfaces such as walls, benches, and floors and are associated with leisure games and ritual divination. Frequent placement in religious structures and private spaces support the idea that patolli boards are connected to ritual, while their quadripartite shapes evoke Maya cosmovision. In this paper we will present ongoing research on three lines of evidence—architecture, ceramics, and several stylistically distinct patolli boards—to expand what we know about games and ritual in the Maya lowlands. Recent excavations at the site of Gallon Jug, in northwestern Belize, revealed multiple, overlapping, and stylistically distinct patolli boards incised into a well-preserved stucco floor. The patolli boards are located in the northern platform of an elite residential group more than 100m away from the Gallon Jug site core. Analysis of a dense ceramic deposit from the same floor will help us understand the function of the structure and the social interactions surrounding gaming and ritual during the Late Classic (AD 600–900) period in the Maya lowlands. Though most patolli boards are discovered in religious structures or private spaces, the context of these patolli suggest that ritual divination may have shaped the social interactions of a wider population.

Novotny, Claire [228] see Kilgore, Gertrude

Nowak, Jesse (University of Oklahoma)

[47]

Chair

Nowak, Jesse (University of Oklahoma)

[166]

Seeing Like an Iconographer: Can Perspectivism Inform our Interpretations of Mississippian Iconography?

This presentation examines the potentials, and possible pitfalls, of applying Viveiros de Castro's theory of Perspectivism to studies of precolumbian iconography in the North American Southeast. Early scholarship in Mississippian archaeology theorized that direct cultural interaction best explained thematic similarities seen with the belief systems from ancient Mesoamerica. Though more recent archaeological evidence suggests a lack of strong material interactions between Mesoamerica and the Southeast, linguistic and folklore studies have contended for ancient and widespread connections throughout the Americas. Anthropological work utilizing alternative ontologies that consider pervasive animacy and shamanistic practices constitutive of a pan-regional Amerindian metaphysics has reignited debates about a deep interconnectedness throughout North America. This work explores theoretical obstacles Southeastern iconographic research historically encounters and asks if a Perspectivist approach could yield innovative models to reconstruct indigenous worldviews, or if it primarily revisits old and current problems seen in our field.

Nowak, Jesse [47] see Deere, Bobi

Nowak, Jesse [166] see Heep, Nathan

Nowell, April [11] see Collins, Benjamin

Nowlin, Jessica [35] see Smith, Alexander

Nuckols Wilde, Catherine (Tulane University)

[84]

A Return to Roots: The Maya—Teotihuacan Inscription at Copan's Temple 26

In the mid-eighth century, Copan's fifteenth ruler, K'ahk' Yipyaj Chan K'awiil, oversaw the completion of Structure 10L-26 (or Temple 26), which was crowned with a stone inscription located within the superstructure. This inscription features a parallel display of Maya full-figure glyphs alongside Teotihuacan-inspired graphics. The style of the inscription is unique in the corpus of Maya texts and is distinct even from the script found on the hieroglyphic stairway leading down from it. Although not yet fully deciphered, initial analyses suggest that the contents of each column mirror each other. In this paper, I analyze the Temple 26 inscription as a tool that draws a parallel between Copan's dynastic founder, K'inich Yax K'uk' Mo', and its twelfth ruler, K'ahk' Uti' Witz K'awiil. Using iconographic and epigraphic approaches, I investigate potential classifications for this inscription (as a biscript, font, etc.) that could lead to a clearer interpretation of its meaning. Finally, I propose that this text embodies an invocation of Copan's dynastic roots in the face of political turmoil, as well as a "hearkening back" to the city's connection to the powerful city of Teotihuacan, at this point long abandoned.

[84]

Chair

Nyaradi, Zsolt [169] see Bews, Elizabeth

Ó Donnabháin, Barra [134] see Alonzi, Elise

Oas, Sarah (Arizona State University) and Matt Peeples (Arizona State University)

[120]

Portion Control: Estimating Vessel Volume and Storage Capacity in the Eastern Cibola Region, New Mexico

The functional analysis of ceramic vessel forms is frequently used to assess the range of activities taking place at an archaeological site. One of the major goals of many such studies is to identify modes in the sizes of vessels used for various tasks. In the U.S. Southwest, this is frequently done by estimating the orifice diameter of bowls and jars using rim diameter charts. For certain vessel forms and wares, however, the volumes of vessels are not strongly correlated with orifice diameter (e.g., collared jars like Tularosa

B/W). In this study, we assess alternative methods for estimating the volume of vessels based on body sherds. We measured and then broke a series of experimental jars into sherds of various size. We then used two methods to estimate the volume of these jars and were able to successfully identify the size modes based on body sherds alone. Using this method, we then estimate the sizes of storage and cooking vessels at a series of sites in the eastern Cibola region to assess changing strategies of food storage through time (ca. AD 1100–1350).

Oas, Sarah [171] see Bocinsky, Kyle

Oberheim, Paul (University of Massachusetts, Amherst), Richard Boisvert (New Hampshire SCRAP) and Mark Doperalski (State Archaeologist of New Hampshire)
[66]

Supporting Paleoindian Viewsheds with the Jefferson VII Site, Jefferson, New Hampshire

Viewsheds provide an integral part in understanding the first peoples inhabiting the early Northeastern landscape. Work conducted by Dr. Richard Boisvert and others have established a way of analyzing the paleo landscape by looking at the vantage point of different settlements excavated in New Hampshire. I intend to add to this list by examining the Jefferson VII site, a hunter's lookout close to the surrounding sites Boisvert has investigated. In addition to the Jefferson VII site I will be comparing other sites across the landscapes to the recently proposed model and against Jefferson VII. In this way I hope to provide a clear sampling between the different datasets of similar sites while providing a number of adequate control sites where the testing has already been done. With this information I hope to increase the amount of data available on paleo overwatch points so that the same methods can be used on other sites to better map the Pleistocene pathways that helped people the region.

O'Brien, Colleen (University of Cincinnati)
[150]

Investigating a Late Classic Maya Plaza through Artifact Distributions to Find Evidence of a Marketplace

Within the field of Mesoamerican archaeology, research on ancient marketplaces, where important economic transactions took place often in large open plaza areas, is just beginning to expand. The Maya, who lived in Central America and Southern Mexico from 250–900 AD in the Classic Period, used such spaces to purchase, barter, and trade every day and ceremonial items such as food, tools, and pottery. However, little evidence of both archaeological and iconographic materials exist in the context of the Maya. My research focuses on the Late Classic plaza at Group D at the site of Say Kah, located in the Three Rivers region of Belize, Central America. My methodology is modeled after one of the "signatures" of a marketplace used by Bernadette Cap in her 2014 dissertation: distinct clusters of artifacts. These clusters, when compared to other lines of evidence, such as soil chemistry, can suggest stall-like or linear patterning indicative of a marketplace. The analysis of artifacts, such as lithics and pottery, from the plaza at Group D will shed light on the plaza's use and may be suggestive of a marketplace, which could alter the way we think about Say Kah's role in the Three Rivers region.

O'Brien, Kaedan [133] see Freiwald, Carolyn

O'Brien, Michael (Texas A&M, San Antonio), Mark Collard (Simon Fraser University) and Briggs Buchanan (University of Tulsa)
[236]

Geometric Morphometric Analyses Support Incorporating the Goshen Point Type into Plainview

Recent work has demonstrated that Goshen points overlap in time with another group of unfluted lanceolate points from the Plains, Plainview points. This has raised the question of whether the two types should be kept separate or consolidated into a single type. We sought to resolve this issue by applying geometric morphometric methods to a sample of points from well-documented Goshen and Plainview assemblages. We found that their shapes were statistically indistinguishable, which indicates that Goshen and Plainview points should be assigned to the same type. Because Plainview points were recognized before Goshen points, it is the latter type-name that should be dropped. Sinking Goshen into Plainview allows us to move beyond taxonomic issues and toward understanding the spatiotemporal variation that exists among Plainview assemblages and what it can tell us about the adaptations and social dynamics of Plainview groups.

Oczipka, Martin [62] see Piezonka, Henny

Odegaard, Nancy [258] see Bisulca, Christina

Odegaard, Nancy [79] see Hanson, Kelsey

O'Donnell, Lexi (University of Mississippi), Ethan Hill (University of New Mexico), Amy Anderson (University of California, Santa Barbara) and Heather Edgar (University of New Mexico)
[80]

Examining the Etiology of Cribra Orbitalia and Porotic Hyperostosis Using Computed Tomography (CT) Scans of a contemporary Sample from the New Mexico Office of the Medical Investigator

Two skeletal indicators of systemic disturbance frequently reported in the bioarchaeological literature are porous lesions: cribra orbitalia (CO) and porotic hyperostosis (PH). Most individuals reported to have active CO or PH at time of death are juveniles between six months and five years old. These lesions have been attributed to nutritional deficiencies or stress incurred during

growth and development. When found together, they have been connected to anemia through comparison with clinical imaging data from severe (typically genetic) anemias. Due to this, CO and PH are often reported together as a linked indicator of systemic stress. However, little is agreed upon about the precise etiologies of either lesion. Further, few studies have examined the potential etiologies of these lesions in contemporary people. Here, we examine the health conditions associated with these lesions in a contemporary sample. We use high-resolution autopsy CT scans of 127 individuals ≤ 15 years of age in addition to associated metadata on individual manner and cause of death, sex, age and race/ethnicity. We find that CO has a higher frequency (27/113) than PH (8/121). Further, there appears to be a significant correlation ($\chi^2=15.6$, $p=0.00$) between presence of CO and lung infections connected to cause of death.

Odsuren, Davahuu [62] see Janz, Lisa

Oechsner, Amy (Eberhard Karls University of Tübingen), Nicholas Conard (Eberhard Karls University of Tübingen) and Simone Riehl (Eberhard Karls University of Tübingen)
[36]

Digging Deeper: A Preliminary Report on the Carpological Analysis of the Middle Stone Age Layers G through A of Sibudu Cave, KwaZulu-Natal, South Africa

The evolution of modern humans has been linked to various cultural adaptations, our understanding of which has been augmented by studies of the African Middle Stone Age (MSA). Sibudu Cave has a well-dated, continuous MSA sequence that spans from Marine Isotope Stage 5 to the Final MSA as well as excellent organic preservation. As indicated by the plant bedding documented at Sibudu, when analyzed together with other classes of material culture an understanding of the use of plant remains helps complete the picture of early behavioral complexity. In addition, by defining the abiotic factors that influenced early humans we can better understand the development of modern behavioral traits. The results of carpological analysis of the upper layers (BS through LBMOD) of Sibudu was published by Sievers in 2006. However, as illustrated by the definition of a distinct "blade bearing tradition" from the deeper D through A layers by Schmid et al. (2019), the lower part of the sequence offers exciting new insights into the MSA. This new study picks up the thread of carpological analysis at Sibudu and digs deeper: offering preliminary data from the analysis of the MSA layers G through A of Sibudu Cave.

Ogburn, Dennis (University of North Carolina, Charlotte), Bill Sillar (University College London) and Alexei Vranich
[127]

Sacred Quarries and Sacred Stones in Cusco: Bringing the Sacred Landscape into the Inka Capital

The Inka heartland was filled with huacas: sacred places/objects, many of which were considered persons or spirits. Many were prominent, fixed features of the landscape, such as mountains, streams, and caves, where ceremonies were regularly conducted. In order to increase the religious power and status of their settlements, the Inka developed practices to bring such places into their built environments via channeling water or carving stones to mirror distant peaks. Given that the Inka considered some stone quarries to be huacas, the act of bringing their stone to build in Cusco is essentially bringing the sacredness of those quarries to the Inka capital. As a corollary, the sacred import of the buildings imparted more status on the quarries that provided the stones. Using data from quarry locations, geochemistry, and ethnohistory, we explore the implications that the sacredness of quarries had for the choosing to exploit different quarries over time to construct Cusco. Among the questions addressed: Were only some quarries considered sacred? Why does one quarry provide almost all of the stone for the most important structures? Were individual building stones considered sacred and/or animate? What are the implications of mixing stone from multiple quarries in construction?

Ogola, Christine [232] see Waweru, Veronica

O'Gorman, Jodie [233] see Painter, Autumn

Ogundiran, Akin (UNC Charlotte)
[192]

Archaeology of Royal Dependents and Palace Economy in the Oyo Empire: A View from Two Residential Spaces in Oyo-Ile and Bara
As in all complex societies, the Oyo Empire (West Africa, ca. 1570–1817) was a network and a hierarchy of co-dependencies. The entire palace administration and palace economy of the empire relied on a disproportionately large number of individuals whose personhood depended on serving the interest of the king. The everyday life of some of these dependents and the hierarchies that existed among them is the subject of this paper. The excavation of two residential structures—one in the palace complex in the royal capital (Oyo-Ile); and the other in the "eternal royal city" (Bara) where the deceased kings were buried—provide insights into how the domestic spaces of the king's dependents were organized. Focusing on the typology of architectural forms, organization of domestic space, and micro-analysis of the spatial distribution and functional attributes of a vast array of artifacts, I make inferences about the social, economic, and rank attributes of these dependents. I also examine what the living spaces may tell us about the everyday lives of these dependents, the organization of the palace economy, and the strategies of labor-management in this West African hegemonic state during the early modern period.

Ohman, Alexis (William & Mary)
[271]

Rations and Recreation: Comparative Analysis of Marine Resources from Betty's Hope Plantation and Shirley Heights Fort in Antigua, West Indies

Historical zooarchaeology has only recently been a focus for archaeological projects in Antigua, West Indies, and has now developed enough to permit broader comparisons within the island as well as with other Caribbean contexts. Betty's Hope plantation and Shirley Heights Fort have yielded an abundance of faunal material that lends well to discussions pertaining to colonial provisioning systems, local Caribbean resource use, and concepts of leisure, dining, and exoticism. Marine resources play a key role in how these lines are drawn, and how such perceptions changed over time. Zooarchaeological evidence of both imported and locally-acquired fish, mollusks, and sea turtle has demonstrated the variety of ways that these animals were acquired and distributed within and between the fort and plantation contexts. This research has revealed distinct patterns based on the race- and class-based divisions on the landscape, and has also highlighted invisibilities in the historical archives pertaining to how local fishing and other marine resource acquisition practices were conducted.

Ojeda Rodriguez, Elizabeth and Derek Smith

[271]

Paleoecological Reconstruction of the Prehispanic Site of Vista Alegre, Quintana Roo, Mexico: An Approach from Zooarchaeology
The objective of this work is to reconstruct ecological conditions from the Late Preclassic to the Postclassic periods (400 BCE–1550 ACE) at Vista Alegre, located on the Yalahau Lake on the northern coast of Quintana Roo, Mexico. This study uses the analysis of faunal bone remains and shell material collected throughout different field seasons at the site to explore the environment in which ancient populations lived and utilized. Contrasting results of the analysis with other coastal sites on the Yucatán peninsula such as Champotón, Cozumel, Xcambó, and Isla Cerritos, this comparative dataset allows for an approximation of past environments, environmental change, and the relationship between prehispanic Maya and their coastal surroundings. This estimation of ecological conditions and influence stands to strengthen past and future research endeavours at the site. Contributing such information adds to general understandings of the ecological conditions that affected prehispanic Maya city development.

Okroy, Jillian (Cardno Inc.)

[167]

A Look into the Vaults: An Analysis of Nineteenth- and Twentieth-Century Burial Vaults at Bethel Cemetery, Marion County, IN
The excavation of Bethel Cemetery provided a unique opportunity to examine the internal and external characteristics of historic burial vaults used in the nineteenth and twentieth centuries. Bethel Cemetery encompassed 543 interments, but only twenty-six individuals were interred in vaults. While the majority of these vaults were intact, some had sustained irreparable damage requiring decedents to be trans-located to new containers prior to reburial. The exterior and, when preservation allowed, the interior of the vaults were documented extensively. These vaults exhibited a range of construction styles and decorative features. Some even displayed company manufacturer names, which provided the starting point for historical research. This research opens a dialogue regarding these artifacts and discusses their effect on the social trends of death, mourning, and burial practices within the context of Marion County, Indiana.

Okumura, Mercedes (University of São Paulo, Brazil), Astolfo Araujo (University of São Paulo) and João Carlos Moreno de Sousa (University of São Paulo)

[73]

Bruce Bradley and His Contribution to Lithic Technological Studies and Experimental Archaeology in Brazil
Bruce Bradley first visited Southeastern Brazil in 2011, to offer a flintknapping workshop, as well as to teach a course about the peopling of the Americas. Since then, he has become an important collaborator in our fieldwork and laboratory analyses, always taking the opportunity to travel extensively throughout the country, to head workshops and teach courses that have influenced hundreds of South American researchers and students. His inspiring presence was of utmost importance to a large number of archaeologists, and it would be not exaggerating to say that he changed the landscape of lithic studies in Southeastern Brazil. In this communication, we will present an example of this proficuous collaboration, addressing the combined use of geometric morphometrics and technology to access diversity in projectile point assemblages from Southeastern Brazil. We will also present the first systematic study of experimental replication made on the abovementioned assemblages. Prior to Bruce's contribution, technology and morphology were regarded in Brazil as mutually exclusive analytic strategies and very little was made in terms of experimental archaeology applied to lithic materials. His open-minded attitude allowed us to work together and produce very relevant data.

[73]

Chair

Ólafsson, Guðmundur [50] see Smith, Kevin

Olds, Julie [49] see Hawkins, Rebecca

Oliveira, Diogo

[250]

Excavations on the Northern Coast of Mozambique: Lingering Questions Surrounding Swahili Traders and the Sea
Swahili society has been described as cosmopolitan, and incorporated art, cultures, peoples, and beliefs of Africa, India, the Middle East, and the Far East. Linked by, and dependent on, the seas and the winds, the ocean served as a conduit of fabulous objects, massive wealth, and world altering ideologies. There are still many lingering questions about the peoples and cultures of the Northern Mozambique coast and its role in the Swahili world. Although Portuguese sources described the cultures surrounding Mozambique Island, there are gaps in our understanding especially regarding their origins. Excavations conducted at Cabaceira

Pequena at the end of 2018 has provided new evidence for transformations and continuations of Swahili society in Northern Mozambique in the fifteenth and sixteenth centuries. Specific maritime shifts have been noted in the archaeological record of the Swahili coast, with the appearance of imported goods, development of specific sailing and fishing technologies, and new architecture along the coast. This paper will show and discuss preliminary results and interpretations of these excavations, and assess the nature of Swahili society at the time of Portuguese arrival in the late fifteenth century.

[250]

Chair

Oliver, Scott and Kevin Bradley (Veterans Curation Program)

[187]

That Sinking Feeling: The Effects of Human-Caused Climate Change at Fort Delaware

Fort Delaware was a Union prisoner-of-war camp during the Civil War located on Pea Patch Island, near Delaware City, Delaware. Between 1993 and 1996, Delaware State Park officials conducted a survey of the eroding Pea Patch Island shoreline. In 2018, the Veterans Curation Program's Alexandria lab began cataloging the artifacts exposed by the erosion and found artifacts of significance to Civil War era life on the island. Throughout its history, Pea Patch Island has been at risk of erosion and submersion due to rising tides and increased storm activity. Human-caused climate change continues to threaten several unexcavated sites associated with its occupation between the War of 1812 and WWII located on the island. NOAA's models show a sea level rise of only three feet would cover nearly the entire island. This poster argues that the significant archaeological sites on Pea Patch Island, nearly all of which have not been studied through systematic archaeological investigation, should be considered high priority given rising sea levels associated with human-caused climate change.

Oliver, Scott [187] see Bradley, Kevin

Olivier, Guilhem (Instituto de Investigaciones Históricas, UNAM) and Vera Tiesler (Laboratorio de Bioarqueología Facultad de Ciencias)

[225]

Open Chests and Broken Hearts: Ritual Sequences and Meanings of Human Heart Sacrifice in Mesoamerica

Beyond the general idea of benefitting society and placating the divine, the polyvalent symbols and meanings of ancient religious sacrifices can be interpreted properly only after combining different disciplinary lenses. In this talk, we scrutinize iconographic and ethnohistorical testimonies of heart sacrifices together with new forensic evidence from across the Mesoamerican landscape. We focus on three different heart extraction procedures, two of which are characterized for the first time. Each reconstructed method (i.e., from below the chest cavity, between two left ribs, and through the sternal bone) provides novel cues regarding the array of ceremonial devices and native concepts of the human body as a cosmic model. Its partitioning and the liberation of vitalizing matter (namely the heart and blood) fed specific sacred forces during divine cult and mythic re-enactment. As for the Aztecs, we conclude that different trunk opening procedures were practiced as part of ritual sequences that in each case enabled access to the Cosmic Sacred Mountain with its vivifying essences. In this context, native conceptions surrounding the distinctive heart-extraction techniques pose new proxies for analogous sacrificial practices in other parts of the world, still awaiting systematic scrutiny.

Olmo-Enciso, Lauro [257] see Castro-Priego, Manuel

Olsen, Bjørnar [159] see Witmore, Christopher

Olsen, Sandra

[60]

Reconstructing Neolithic Hunting Strategies and Prey Species from Arabian Rock Art

Arabian rock art offers an extremely rich supplement to data obtained through excavations and surveys. While interpretations of Arabian petroglyphs are beginning to reveal new information about prehistoric rituals and belief systems, they also contribute substantial evidence regarding more pragmatic aspects of daily life. Hunting scenes depict the weaponry used, including both simple and recurved bows, spears, and at least three types of throwing sticks. Packs of hunting dogs resembling the modern Canaan breed are shown using wolf tactics, surrounding the prey and even biting the muzzle of a gazelle in one case. A wide range of large game species are depicted, including gazelles, ibexes, bezoar goats, Arabian and Scimitar-horned oryxes, onagers and African wild asses. Small game and fowl are rarely depicted, but may be implied by the use of throwing sticks. Close encounters with a lion and proximity to cheetahs, leopards, hyenas, and wolves portray hunters in dangerous situations.

Olson, Kaelyn [147] see Porter, Keri

Olson, Paige

[44]

Discussant

Olszewski, Deborah [36] see Abdolazadeh, Aylar

O'Mansky, Matt (Youngstown State University), David Parker (Youngstown State University), Caleb Self (Youngstown State University) and Samuel Witham (Youngstown State University)
[252]

Five Centuries of Post-occupation Formation Processes: Excavations at the Dim Bay Site, Bahamas

SS-5, the Dim Bay site, is a prehistoric Lucayan site on the east side of San Salvador Island, Bahamas. Ongoing research reveals intricate stratigraphy in comparison to other sites on the island. While most sites on San Salvador are in protected locations on the leeward sides of dunes, SS-5 is on a low transverse dune by the beach between the ocean and an inland lake. This setting has exposed SS-5 to centuries of extreme storms, including hurricanes and surges, while erosion and changing sea levels have further shaped the site. As a result, SS-5 is composed of at least three strata: A sterile light-colored sand stratum, a darker colored loamy sand cultural horizon, and a lighter colored sand intermixed with plastic. The cultural horizon, buried under increasing amounts of sediment, represents the top of the dune at the time of occupation. This stratigraphy represents the passage of four periods of time. In this presentation, we describe research methods and findings at SS-5 with a focus on formation processes that gave the site its present form—and continue to play havoc on the sedimentology of the island as a whole and threaten the continued existence of the Dim Bay site.

Omori, Takayuki [182] see Kanezaki, Yuko

Omura, Sachihiro [27] see MacIntosh, Sarah

Oncebay Pizarro, Noemi [21] see Dalton, Jordan

Ono, Rintaro (National Museum of Ethnology), Jason Lebehn (Historic Preservation Office, Pohnpei State, FMS), Osamu Kataoka (Sophia University, Japan), Takuya Nagaoka (Pasifika Renaissance, Japan) and Scott Fitzpatrick (University of Oregon, USA)
[100]

When Did the Early Migrants Reach Pohnpei? Human Migration, Interisland Networks, and Resource Use in Eastern Micronesia

Previous studies on islands in eastern Micronesia show possible early human migration from Melanesia by the descendants of Lapita groups, while the certain date for such early migration is yet unclear. To explore the initial population dispersals into Pohnpei Island where can be one of the center for past human migrations in East Micronesia, we have conducted new archaeological excavations on Lenger, a lagoon island located in northern Pohnpei. While research only began in 2019, a significant quantity of CST pottery and a variety of shell artifacts in the form of tools and ornaments were found at a depth of 1 m in a white beach sand layer that was below current sea level. The previous test excavation on the same site by the HPO and Nagaoka in 2008 found a piece of obsidian. The XRF (X-ray Fluorescence) analysis by Shepard confirms it is possibly from Admiralty Islands in Melanesia. In this paper, we discuss when the early migrants reached Pohnpei and their island(s) of origin based on our finds. We also discuss the interisland networks and resource use by early migrants in Pohnpei and more broadly in eastern Micronesia.

Oosterbeek, Luiz [11] see Matos, Daniela

Ordoñez, Maria (Universidad San Francisco de Quito), Lourdes Torres (USFQ) and Tamara Landivar (Museo Pumapungo)
[257]

DNA and CT Analysis of the National Tsantsa Collection: A Scientific and Community Approach to Museum Archaeology

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-twentieth 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 information gathered from DNA sampling.

Ore, Gabriela [175] see Zimmer-Dauphinee, James

Orlando, Ludovic (CNRS, University Paul Sabatier, Toulouse, France), Alan Outram (University of Exeter, UK) and ERC PEGASUS Consortium (CNRS, University Paul Sabatier, Toulouse, France)
[173]

Rewriting Early Horse Domestication with the Help of Both Archaeology and Ancient DNA

Today, except in developing countries where they remain essential to farming, horses are often limited to sport and leisure. Yet, not so long ago, they were essential to human societies. They provided us with speed, which revolutionized the way our genes, diseases, goods and languages circulated across the planet, and effectively globalized the world for the first time. They fundamentally changed the way we made war and represented key military assets to past civilizations. Yet, the process of early horse domestication is difficult to reconstruct from archaeological data alone as, in contrast to other domestic species, horses are not common in Neolithic assemblages and their size did not massively shift during early domestication. Within the ERC PEGASUS consortium, we leverage both archaeological and ancient DNA data to clarify the temporal and geographic loci underlying horse

domestication. DNA was essential to overcome the limitations of a too often fragmentary record, especially for sex and hybrid identification. This, in turn, has helped us revise the timing of the first mule industry, and document the recruitment strategies underpinning mule breeding in different cultures. Here, we present how the constant dialogue between archaeologists and geneticists was fundamental to our recent discoveries.

O'Rourke, Dennis [244] see Potter, Bethany
O'Rourke, Dennis [100] see Stone, Jessica

O'Rourke, Makayla [77] see Cromwell, RP

Orsini, Stephanie [270] see Alsgaard, Asia
Orsini, Stephanie [241] see Jones, Ashley

Ort, Jennifer (SEARCH Inc.)

[190]

Diners, Drive-Ins, and Caribou Drives: Paleoindian Subsistence and Settlement Patterns in the Northeast: Perspectives from the Bull Brook Site, Ipswich, MA

Paleoindians are considered one of the earliest people to enter the Americas, arriving in the northeastern U.S. approximately 13,000 years ago. Previous research at the Bull Brook I (BBI) site in Ipswich, MA demonstrated that it represented a single communal gathering (or aggregation) by identifying concentric activity patterns that are difficult to explain outside of an organized event (Robinson et al. 2009; Ort 2012). A smaller site, Bull Brook II (BBII) was also identified and is located approximately 300 m southeast of the BBI site. While temporally associated with the Bull Brook Phase, BBII's tool and lithic assemblage and lack of an organized settlement pattern suggest they were not occupied contemporaneously. Caribou, one of the primary resources of Paleoindians, has been identified within the BB I assemblage but the site was destroyed by an active gravel pit. However, portions of BBII may be extant and new investigations may yield crucial new data to understanding the unique juxtaposition of the two sites. This presentation will focus on new research being conducted at the BBII site, using both traditional archaeological techniques and noninvasive survey methods as a part of Ort's PhD research at the University of New Hampshire's NRESS Program.

Ortega, Karla [137] see de Anda, Guillermo

Ortiz, Agustin [133] see Barba, Luis

Ortiz, Byron, Pedro Fiallos (Archeologist Staff member) and David Brown (Codirector Assistant Consultant)

[201]

La arqueología política y el nuevo asedio de Cochasquí ¿Quién es el dueño de la arqueología?

El sitio monumental del Cochasquí, ubicado en la Provincia de Pichincha dentro del Cantón Pedro Moncayo, a partir de ser uno de los sitios arqueológicos más importantes del Ecuador, tiene gran importancia en la histórica y política nacional. Por eso el Proyecto Arqueológico Cochasquí-Mojanda sin sorpresa se ha encontrado inmerso en disputas de índole político y personal lo cual nos puso en la necesidad de pensar sobre el uso que se le da a la cultura, quién es el dueño de la arqueología, y más específicamente la arqueología con que fines se la está realizando. Así pues, estando en medio de una disputa por el manejo del Parque Arqueológico Cochasquí se ha puesto en duda nuestra ética, moral y profesionalidad, obligándonos a navegar entre los muchos interesados: los del parque provincial, la comunidad científica local e internacional, y ciudadanía en general del cantón y de los pueblos alrededor.

Ortiz, Soledad [20] see Alonso, Alejandra

Ortiz Brito, Alberto (University of Kentucky)

[191]

The Meanings and Uses of the Past in the Present: A Case Study of the San Martín Pajapan Monument

This presentation addresses the relation between archaeological patrimony and collective memory using the San Martín Pajapan (SMP) monument as a case study. The SMP monument is an Olmec monument found on the top of the San Martín Pajapan volcano of Los Tuxtlas region. According to ethnographic research done in the 1960s, the local communities settled in the vicinity of the volcano regarded the SMP as the embodiment of a deity called Chane. In 1966 Alfonso Medellín Zenil conducted an archaeological project aimed at moving the SMP monument from the volcano to the Museo de Antropología de Xalapa (MAX). Apparently, local communities let Medellín Zenil move this monument to the museum; however, in the 2000s they requested the MAX to return it to them. Instead of returning the monument, the MAX decided to donate a replica of it which local communities welcomed with a solemn ceremony in 2006. These two events led to a process of oblivion and remembrance of the SMP monument. In this presentation, I provide ethnographic data to indicate what beliefs related to this monument have been forgotten and what are still remembered. I argue that despite the oblivion effects it is still used as a local identity element.

Ortman, Scott (CU-Boulder), Claire Ebert (Northern Arizona University), Amy Thompson (University of New Mexico), Michael Smith (Arizona State University) and Robert Rosenswig (University at Albany, SUNY)

[26]

Where Scaling Theory Breaks? The Case of Mesoamerican Low-Density Urbanism

Lowland Mesoamerican cities are often considered a paradigmatic case of low-density urbanism and a distinctive type of spatial organization relative to contemporary cities. In this paper, we examine how settlement patterns in the Mesoamerican southern lowlands were both similar to and different from those typically found in the settlement systems characterized by settlement scaling theory. We find that the population-area relationship for these settlements overall differs greatly from that reported for other agrarian systems, but that other scaling relations appear more typical when epicenters are considered as the relevant mixing areas for their associated populations. Collectively, these results suggest people of the Mesoamerican southern lowlands congregated for social mixing on a slower temporal rhythm than is typical in contemporary urban systems. In this way, increasing returns could be realized in civic construction, and presumably other activities, even as most people arranged themselves in space with respect to primary production resources. Our results suggest the primary difference between low-density urbanism and contemporary urban systems is the frequency of social mixing.

[26]

Chair

Ortman, Scott (CU-Boulder)

[48]

Discussant

Ortman, Scott [26] see Robinson, Erick

Osborn, Jo (University of Michigan), Camille Weinberg (University of Texas, Austin), Kelita Pérez Cubas (Pontificia Universidad Católica del Perú) and Richard Espino Huaman (Universidad Nacional San Luis Gonzaga de Ica)

[21]

The Development of Economic Specialization among Prehispanic Fishermen: The Case of Jahuay, Quebrada de Topará, Chíncha

According to colonial documents, Peruvian coastal societies were divided into economically specialized communities, some dedicated to agriculture, and others to fishing. Archaeological studies have demonstrated that this economic organization predated the Inca Empire, but the origins of this system are still undefined. Since 2017, the Proyecto de Investigación Arqueológico de Jahuay has led excavations at Jahuay, a littoral village that was occupied by Topará fishermen during the late Early Horizon, when permanent hierarchical societies first appeared in the Ica region. We ask whether the shift in social and political organization may have contributed to economic changes as well. Did the Topará people rely on incipient economic specialization? Our research helps elucidate an understudied period in Peru's prehispanic economic development.

[21]

Chair

Osborn, Jo [21] see Larios, Jennifer

Osborn, Jo [125] see Weinberg, Camille

Oseguera Sotomayor, Sandra [235] see Habu, Junko

O'Shea, Colleen [21] see Dalton, Jordan

O'Shea, John (University of Michigan)

[238]

Necessity, Not Novelty: Archaeology on Submerged Landscapes

Despite recent advances in method and approach, the underwater archaeological record continues to make a negligible contribution of prehistoric research. This is due, in part, to a series of widespread but erroneous beliefs about the character of the submerged record. These include the belief that underwater finds are chance encounters that are not susceptible to systematic investigation, and that submerged sites and artifacts are only interpretable via reference to known terrestrial finds. This paper addresses these misconceptions. It is argued that the underwater context can be systematically investigated and, far from simply supplementing or amplifying what is already known from terrestrial research, can produce startling and unexpected results. These points are illustrated by reference to recent underwater research in Lake Huron and its implication for the "Standard Model" of Paleoindian archaeology in the Great Lakes region. It is concluded that terrestrial archaeologists ignore the underwater record at their peril.

Osores, Carlos

[242]

Animal Economy at Cerro La Guitarra, Zaña Valley, Peru

This poster examines the faunal remains retrieved from distinct refuse deposits from several sectors at Cerro la Guitarra, Zaña Valley, North Coast of Peru. Cerro la Guitarra dates to the Late Intermediate Period—around 1200 to 1300 AD—during which Chimú state expands into the Lambayeque/Sicán territory. The site is a fortified settlement that contains an important amount of domestic enclosures and temples or "huacas", and is surrounded by concentric walls. The site covers approximately 130 hectares containing 9 sectors. Differences on animal economy between sectors have been identified which it would correlate with the social diversity at the site—for example, we found differences on the consumption of mammals and fishes ("machete"—*Ethmidium maculatum*—or

"Iorna"—*Sciaena deliciosa*), and shells. These differences would indicate that the inhabitants of the different sectors may have employed different modes of economy. Finally, daily life would have occurred in non-isolating conditions, due to they maintained contact with people from other parts of the valley as fishermen located 12 km from the site.

Osorio León, José [102] see Stanton, Travis

Ospina, Catalina [258] see Katz, Monica

Ostahowski, Brian (Louisiana Archaeological Society), Jayur Mehta (Florida State University) and Theodore Marks (New Orleans Center for the Creative Arts)

[222]

Investigations at the Adams Bay Site (16PL8), a Plaquemines Mound Complex Located in Plaquemines Parish, Louisiana

This paper provides an overview of fieldwork investigations conducted at the Adams Bay Mound site (16PL8) located in Plaquemines Parish, Louisiana. This Plaquemines mound complex site (1200–1500 AD) is situated on a subsiding and eroding marsh island, which is actively being destroyed. An interdisciplinary team including archaeologists, wetlands biologists, and high school students from the New Orleans Center for the Creative Arts (NOCCA), collected multiple lines of information on the site and the ecology of the marsh island to help develop management recommendations for coastal mound sites similarly threatened by land loss.

Ostahowski, Brian [18] see Hollingshead, Analise

Osterholtz, Anna (Mississippi State University/Cobb Institute of Archaeology)

[131]

The Body Poetic: Violence, Body Processing, and Identity Formation in the Past

Deb Martin's legacy is one of exposing her students and colleagues to new theoretical models, asking everyone to contextualize bioarchaeological data within robust theoretical frameworks. Through Dr. Martin's mentorship, I began to think of the body differently. The human body can be viewed as an artifact of cultural expression, a mechanism for social communication, a malleable substance that can be shaped to meet the needs of the living. The Poetics model developed by Whitehead has been adapted to the study of the past through both the study of violence and the study of mortuary processing. In this paper, both applications of the Poetics model will be examined through bioarchaeological case studies, combining social theory and bioarchaeology employing a biocultural model. I will examine the role of both violence and processing at Sacred Ridge (~AD 800, southwestern Colorado) and the reuse of burial space within the church at Đurđevac-Sošice (eleventh to sixteenth-century Medieval Croatia). These case studies span time and space, showing the relationship of the living and the dead and how the dead can be manipulated and processed to suit the needs of the living.

O'Sullivan, Rebecca [193] see Moates, Jeffrey

Oswald, Jessica [27] see LeFebvre, Michelle

Otárola-Castillo, Erik (Purdue University)

[55]

Why a Bayesian Archaeology? A Pain-Free Introduction

Bayesian inference and its underlying philosophy offer an alternative to null hypothesis significance testing (NHST), the conventional statistical framework in archaeology. Due to new technological advances, Bayesian inference has become an essential component of wider scientific efforts and progressively prevalent in anthropological and archaeological research. Here, without using mathematical or statistical jargon, I provide a sensible explanation of Bayesian statistics in comparison to NHST. I follow by clarifying why Bayesian inference 1) is a natural and powerful approach, 2) provides straightforward interpretations, and 3) is applicable and desirable to archaeologists. To finish this talk, I briefly review of how Bayesian statistics are currently applied to solve archaeological problems, highlighting potential areas where its creative application might produce informative solutions.

[55]

Chair

Otárola-Castillo, Erik (Purdue University)

[217]

Discussant

Otárola-Castillo, Erik [55] see Coon, Sarah

Otárola-Castillo, Erik [147] see Gozner, Amanda

Otárola-Castillo, Erik [176] see Torquato, Melissa

Ouellet, Jean-Christophe [12] see Gates St-Pierre, Christian

Outram, Alan (University of Exeter)**[73]***Understanding the Settlement Structure of Early Horse Herders in the Eneolithic of Kazakhstan: New Geophysical Surveys and Ground-Truthing at Botai and Borly 4*

Bruce Bradley carried out three seasons of survey and excavation at the Botai Culture sites of Krasnyi Yar and Vasilkovka. This work produced the first extensive geophysical surveys showing Botai Culture settlement structure (Olsen, Bradley, Maki and Outram 2006). This paper presents the results of more recent surveys of the eponymous site of Botai as well as a newly discovered Eneolithic site of a different culture in the Pavlodar region, called Borly 4. Both these survey have been subject to limited ground-truthing excavations and dating. The settlement structures seen at all these sites are compared and discussed within the context of the development of early horse husbandry. Lines of future enquiry are also outlined.

Outram, Alan [173] see Orlando, Ludovic

Overfield, Zachary and Ashley Eyeington (SWCA Environmental Consultants)**[165]***Iron and Convict Labor: The Archaeological Investigations of the Rusk State Penitentiary*

In 1875, the Texas Legislature commissioned the construction of the Rusk State Penitentiary to alleviate overcrowding at the state prison in Huntsville. Incarcerated and free laborers built the penitentiary and associated facilities between 1877 and 1878. The state then put the incarcerated laborers to work in the newly constructed iron foundries producing iron used in the construction of the State Capitol. The iron operations at the prison ultimately proved to be unprofitable, and the prison was converted to the Rusk State Hospital in 1919. From June 12 to June 21, 2019 SWCA Environmental Consultants (SWCA) conducted archaeological field investigations of the Rusk State Penitentiary archaeological site (41CE487) located in Cherokee County, Texas. The SWCA intensive survey and excavation determined that the investigated portion of site 41CE487 contains multiple subsurface archaeological features associated with the late-nineteenth to early twentieth-century Rusk State Penitentiary period of the Rusk State Hospital complex. These features include the remains of a brick building, a mule cart track, iron foundry infrastructure, and the Texas & New Orleans Railroad. The archaeological features identified during the investigation provide insight into the construction and operation of the Rusk State Penitentiary and the lifeways of incarcerated persons within the Texas convict-labor system.

Owen, Ross (Dudek)**[30]***Scratching the Surface: A Pilot Study of the Lithic Sourcing Potential of South Mountain Rhyolite*

The primary source for rhyolite in Pennsylvania, the prehistoric quarries of South Mountain are well-known for their importance as a lithic resource—especially in association to the Susquehanna Broadspear industry. While they are widely known, neither the quarries nor the source material have been studied intensively. This presentation will focus on the use of x-ray fluorescence (XRF) and Laser-induced breakdown spectroscopy (LIBS) to gain a better understanding of the lithic material and the potential to trace artifacts to their origins through geochemical analysis. In addition to comparing the analytical techniques this paper addresses potential pitfalls and best practices for pilot studies of heterogeneous lithic sources in archaeological contexts. Highlighted is the need for an inter-disciplinary team of researchers with the understanding that initial attempts at lithic sourcing require patience and determination are crucial to apply proven lithic sourcing techniques to new types of stone. The findings have helped to establish future research potential and management priorities and recommendations for rhyolite quarry sites located on Commonwealth lands.

Owenby, Gary [197] see Powis, Terry

Owsley, Douglas (Smithsonian), Karin Bruwelheide (Smithsonian), Éadaoin Harney (Harvard University), William Kelso (Jamestown Rediscovery) and David Reich (Harvard Medical School)**[173]***Identifying Seventeenth-Century Africans and High-Status Englishmen at Jamestown, Virginia*

Emerging investigative techniques and access to reference skeletal series and comparative databases allow enhanced interpretation and recognition of individuals in the seventeenth-century Chesapeake region for which few documentary sources or identifying artifacts exist. As part of a pilot study of burials from Jamestown, genome-wide ancient DNA were obtained from four poorly preserved skeletons: a male and female excavated from within the 1607 Fort palisade, originally identified as colonists from the first years of the settlement, and two high-status males buried in the chancel of the 1608 church. Based on historical and bioarchaeological evidence, the latter are suspected kinsmen of the colony's first Governor, Thomas West, 3rd Lord De La Warr. Archaeological, historical, genealogical, osteological, and genetic evidence are integrated in this approach. The male and female excavated from the Fort possess African ancestry—most closely related to present-day Nigerian populations—with no European ancestry. The men in the church have European ancestry and share a rare mitochondrial haplogroup which may be indicative of unanticipated maternal relatedness. This interdisciplinary study demonstrates how remarkable methodological analyses can transform interpretations often guided by preconceived notions of identity based on site context and the inherent limitations of the historical and bioarchaeological record.

Oxenham, Marc [199] see Adams, Alisha

Oyuela-Caycedo, Augusto (University of Florida)**[174]***Discussant***Ozbun, Terry (AINW)****[198]***Reanalysis of Windust Phase Artifacts from the Rock Island Overlook Site, 45CH204, Chelan County, Washington*

Archaeological salvage excavations conducted in 1974 at the Rock Island Overlook site revealed artifacts characteristic of the Windust Phase on the Columbia Plateau. At the time of the original excavations the earliest occupation of the site was thought to be about 7,000 years old, but recent dating of Windust at other sites suggests these materials could be 11,000 to 13,500 years old. This presentation summarizes a re-analysis of selected artifacts from the Rock Island Overlook site. Re-analyses show that one of the stemmed Windust projectile points retains blood residues from a Pleistocene horse. This result and the findings of geochemical obsidian sourcing, obsidian hydration dating, and technological analysis of debitage shed new light on Windust Phase dating and Pleistocene lifeways on the Columbia Plateau.

Pacheco, Ellen (University of Calgary), Elizabeth Paris (University of Calgary) and Roberto López Bravo (UNICACH)**[150]***Rodents of Moxviquil, Chiapas, Mexico*

Ellen Pacheco, University of Calgary Elizabeth Paris, University of Calgary Roberto López Bravo, UNICACH The site of Moxviquil, located in the Jovel Valley in the highlands of Chiapas, Mexico, was an important local political center during the Late Classic (AD 600–900) and Early Postclassic (AD 900–1250) periods. This paper centers around the faunal remains found in a funerary cave at Moxviquil, located on a steep hillside below an outlying residential settlement. The cave was an important locus for ritual, while also reflecting a wide range of dietary practices through food offerings and evidence for long-distance exchange of animal products. The funerary cave's faunal assemblage included a variety of rodent species, which appear to have been of particular dietary and ritual importance. Key species identified include various rat species such as the hispid cotton rat (*Sigmodon hispidus*) and the Mexican woodrat (*Neotoma mexicana*), agouti species (*Dasyprocta agouti*), as well as a rabbit species, specifically the cottontail rabbit (*Sylvilagus* sp.). Ethnographic data from highland Chiapas suggests that the trade and consumption of rodents continues to be important, including use in traditional medicine, suggesting parallels between modern and ancient highland communities

Pacheco-Cobos, Luis [29] see Thompson, Amy

Pacheco-Forés, Sofía (Arizona State University)**[134]***This, That, and the Other: Alterity, Migration, and Violence in Epiclassic Central Mexico*

Within Mesoamerica, ritual violence and human sacrifice have long been topics of anthropological inquiry. In this study, I investigate how Mesoamerican conceptions of alterity relate to the expression of ritual violence in the past. I use prehispanic codices and Contact era ethnohistoric accounts along with published archaeological data to reconstruct which aspects of individuals' social identities would have been understood as meaningful markers of social difference. I then scrutinize these Mesoamerican conceptions of social difference through a bioarchaeological case study of a massive human sacrificial deposit from Epiclassic central Mexico (600–900 CE). I examine specific notions of Mesoamerican alterity—such as geographic origins and ethnicity—with bioarchaeological proxies, including biogeochemical and biodistance data, to test whether such conceptions of social difference predisposed individuals to ritual violence.

Paden, Erin (Director of Historic Preservation)**[113]***Discussant***Padon, Beth (Partners for Archaeological Site Stewardship)****[186]***Designing Archaeological Mitigation Plans That Offer Greater Public Benefit*

When ground-disturbing projects and cultural resources occupy the same space, the first choice is to change the project to avoid impacts. If that is not possible, then archaeologists conduct mitigation to recover as much public benefit from the cultural resources as possible. This difficult task is made worse when the mitigation is started after the impacts occur. In 2012, a once-in-a-lifetime rainstorm event in the Colorado Desert of southern California resulted in major erosion which damaged an archaeological site on public land. The erosion was amplified by the previous grading at an adjacent construction site. Native Americans, state and Federal agencies, and the company that was building the adjacent facility responded by working together to develop a long-range plan to field check the site with trained Native American monitors. Periodic and systematic monitoring maximizes public benefit in several important ways — by increasing the understanding that the monitors and their tribes have with this ancestral site, by creating more complete site recordation to save information that could be lost with future episodes of erosion, and by leveraging the time and skills of the public agency archaeologists. This mitigation offers a model that may be successful at other sites.

Page, Sarah [148] see Portman, Katherine

Pailes, Matthew (University of Oklahoma) and Natalia Martínez-Tagüena (CONACYT/IPICYT)**[15]***Future Discounting in Subsistence Decisions: The Case of Hohokam Agave Bajada Cultivation*

This presentation will investigate the relevance of future discounting behavior to pre-colonial subsistence decisions by examining Agave sp. bajada cultivation among the Hohokam of southern Arizona during the Classic period, AD 1150–1450. The Hohokam Classic period was tumultuous and included a variety of social upheavals that resulted from and precipitated subsistence shortages. During this period, several communities lessened their investment in agave cultivation or substantially shifted production strategies. A program of experimental archaeology demonstrates agave's higher kcal/hour return than most approaches to maize agriculture, making these changes difficult to interpret based on return rates alone. This paper will argue this counterintuitive behavior is explained by agave's decade long maturation period, which made it unattractive relative to more immediate return resources in any context that presented risks to land tenure. This case study illustrates that even slight discounting of future rewards can significantly alter subsistence strategies and lead to higher risk investments.

Pailes, Matthew [79] see Krug, Andrew

Paine, Richard (University of Utah), Enrique Hernández (Universidad de San Carlos) and Richard Hansen (University of Utah)**[163]***Invisible Structures at El Mirador: Challenges and Prospects*

Invisible, or hidden, structures present serious, and difficult to solve challenge for Mayanists. Despite a generation of research into Classic period invisible structures, we know little about their prevalence, history, or range of uses. We know even less about Preclassic invisible structures. It is clear they are widespread at El Mirador, we encounter them repeatedly in other excavations, but their true extent is unknown. This presentation will focus on our efforts during the 2018 and 2019 field seasons to develop a protocol for assessing the role of invisible structures in the El Mirador settlement system. We will discuss our attempts to sample invisible structures, based on remote sensing using GPR, and excavations of identified invisible structures to assess chronology and function.

Painter, Autumn (Michigan State University), Jeffrey Painter (Michigan State University), Jodie O'Gorman (Michigan State University) and Terrance Martin (Curator Emeritus of Anthropology, Illinois State M)**[233]***Surviving or Thriving? Reassessing Warfare Related Food Insecurity at Morton Village*

Since initial excavations in the mid- to late-1980s, Morton Village and associated cemetery, Norris Farms #36, have been used as a primary example of low-scale warfare and resulting stress and insecurity in prehistory. While evidence of violence is clear, the evidence for subsistence insecurity is based on a small sample of contexts from a restricted section of the overall site. Recent excavations have also found evidence of a complex and productive community, further complicating this representation of Morton Village. In this paper, we re-examine the evidence of violence-related food insecurity through an analysis of faunal remains from a random sample of contexts across the entire village area. Our results support new interpretations of life at Morton Village, and indicate that we must continue to refine our models and methods for detecting food insecurity in the past. In particular, decoupling food insecurity from warfare may be informative for understanding the relationship of these two conditions.

Painter, Jeffrey [233] see Painter, Autumn

Pajuelo Montes, Rosario Beatriz [57] see Brock, Amanda

Pal Chowdhury, Manasij (University of Manchester), Stuart Campbell (Department of Classics, Ancient History and Arch.), Sharon Fraser (Department of Earth and Environmental Sciences), Bart van Dongen (Department of Earth and Environmental Sciences) and Michael Buckley (Department of Earth and Environmental Sciences)**[120]***What's Cooking? A Multipronged Approach to analyze Ceramic Residues from Tell Khaiber 1*

Analysis of biomolecules absorbed in unglazed ceramics can provide valuable information about pottery use in antiquity, including detailed information on ancient diet. Such investigation has mostly focused on the analysis of lipids, but recently the more labile proteins have seen increased attention as they are capable of providing more specific information. In this study, we analyze absorbed proteins and lipids extracted from a collection of ceramic shards obtained from Tell Khaiber 1, dating from the Sealand Dynasty period (c.1500 cal BC), near the ancient city of Ur in present-day Iraq. ATR-FTIR and elemental analyses of the ceramics will be presented, along with results of the analysis of lipids using GC-MS and of proteomic analysis using LC-MS (Orbitrap) and MALDI based techniques, with the results from different techniques compared. Our results show that although the survival of proteins is less widespread as compared to lipids, they provide a greater degree of information. This is exemplified by the identification of evidence of soybean use from one of the sherds, the earliest such occurrence in Mesopotamia and one of the earliest outside East Asia.

Palazzolo, Kyle (California State University, Chico)**[83]***When Mortars Speak Volumes: Assessing the Influence of Mortar Cavity Size on Processing Efficiency*

Among the various categories of ground stone technology in pre-colonial California, the mortar has a celebrated role in the

economic shift to acorn processing. The size and shape of mortars, both bedrock and portable, facilitated the pulverizing and grinding of these and other bulk resources. It seems logical, therefore, to assume that the larger the mortar cavity, the more productive the mortar would be. The experiment presented here was designed and conducted to test this hypothesis; it aims to determine whether or not increasing the depth and width of a mortar cavity improves acorn meal production, and if so, to what degree. While there are various constraints to making larger mortars (such as time, material, labor/exertion, mobility, etc.), understanding the efficiency of mortars with greater volume is an essential first step to assessing the cost-benefit trade-off inherent to the design choices that were made by Native Americans.

Paling, Jason (Plymouth State University), Rachel Horowitz (Appalachian State University) and Mary Clarke (Boston University)

[20]

Tools of the Trade: A Review of the Lithic Technologies Associated with Ancient Maya Mines and Quarries

Archaeologists working in the Maya area have long collected evidence of the tools used for the production, transportation, and processing of various kinds of mined and quarried stone resources. These studies focused on tools found within or near mine and quarry contexts and their presumed functions. The integration of use-wear analyses and experimental approaches expanded our ability to interpret what role particular artifacts played in ancient work, regardless of their collection location. By combining information from mines and quarries with experimental, use-wear, and ethnohistoric information, we can provide further evidence of the technologies utilized for resource extraction. This paper will synthesize previous research on mining and quarrying implements to create a comparative framework through which similar technologies can be evaluated. These comparisons will aid in lithic analyses, interpretation of household activities, and provide frameworks for future experimental work to better understand the processes of ancient Maya resource extraction.

Palka, Joel (Arizona State University) and Alice Balsanelli (Universidad Autónoma de México)

[127]

Contemporary Lacandon Ritual Landscapes and Ancient Maya Shrine Archaeology in Chiapas, Mexico

Landscape features around Lake Mensabak, Chiapas, Mexico, attracted ritual attention from ancient Maya in various ways. For instance, they artificially transformed Mirador Mountain into many shrines for communal ceremonies. Burials and offerings were left at the Mensabak cliff shrine on the lake shore, but on a smaller scale. On the other hand, Bat Cave, an impressive cavern, had no rituals at all. Perhaps contemporary Lacandon ontology and ritual landscapes shed light on the differences in these ancient ritual places. For Lacandon, landscapes contain animistic forces, but the important ones are homes of non-human entities or deities where people communicate with them. Hills and caves where Lacandon have key social relationships with resident forces, and other Lacandon, are the places of many ceremonies and offerings to nourish them. These shrines do not represent deities, they are deities. Other landscape nonhuman entities or ones with lesser animistic forces receive little ritual attention. Ancient Maya, therefore, likely maintained relationships with nonhuman entities, and other Maya, at important shrines and left fewer offerings at shrines of no consequence with reduced animistic powers. Thus, social interaction and shrine histories helped determine Maya ritual landscape importance.

Palka, Joel [204] see Sanchez, Fabiola

Palonka, Radoslaw and Vincent MacMillan (Canyons of the Ancients National Monument, BLM)

[60]

Archaeoastronomy, Beliefs, and Warfare in Sand Canyon, Colorado: Documentation, Methodology, and Interpretation of Rock Art

This paper focuses on the presentation of selected examples of Ancestral Pueblo rock art panels from some cliff dwellings or other sites dated roughly to the thirteenth century AD and located in the Sand Canyon area within the Canyons of the Ancients National Monument, southwestern Colorado (USA). Some of the rock art panels depict fighting scenes while others might have been connected with astronomical observations as seasonal, solar or lunar markers and the possible ceremonies and rituals associated with them. At two of these sites, 5MT129 and 5MT261, direct observations were conducted during the winter solstice of 2018 and spring equinox and summer solstice of 2019. These observations yielded some interesting results and were supplemented by research in ethnographic literature as well as simulations and visualizations using different software and equipment. The methodology for recording these rock art panels included on-site hand drawing, photography, photogrammetry, and laser scanning documentation. The registered data has been used to generate accurate 2D documentation and 3D models as well as RTI (Reflectance Transformation Imaging) analysis. Hopi representatives were also consulted in the field regarding some of these rock art panels, offering invaluable help and interpretations based on Pueblo oral traditions.

Palus, Emily (U.S. Department of the Interior Museum Program)

[92]

Moderator

[92]

Discussant

Palus, Emily (U.S. Department of the Interior Museum Program)

[186]

Not Just for Bureaucrats: Digitizing the Antiquities Act Permit Administration Records and Exploring the History Federal Policy for the Investigation of Archaeological Sites and Curation of the Collections

The Antiquities Act of 1906 is lauded as the foundation of American archaeology. It is, on many levels. Asserting public interest, Section 3 established Federal policy to safeguard sites on Federal lands from haphazard digging and looting through a permitting

framework. Those deemed qualified were authorized to conduct excavations and the resulting collections preserved permanently in public museums. Subsequent regulations required reports, which became a foundation of the discipline's published literature. The administrative record is also foundational; permit files at the National Archives, Smithsonian, and elsewhere document Department of the Interior oversight of archaeology on Interior lands. From handwritten letters in 1906 to typed correspondence over decades, communications among Federal officials and archaeologists offer administrative histories of projects, including with terms and conditions prescribed in authorizations, as well as document trends in practices and engagement with Indian tribes. In 2019, the Interior Museum Program initiated a digital archive project to establish a framework for scanning records and recording metadata to make this information accessible and connect relevant materials in different locations. Not only can these records help track collections from Interior lands and inform collections management and NAGPRA responsibilities, historic permit administration explains the basis for many modern practices.

Palus, Matthew (The Ottery Group)

[193]

Cultural Resource Management and Heritage Struggle in Metropolitan Washington, DC

This presentation discusses two cases from Washington, DC and its suburbs that were both contested in different ways, where public engagement and consultation were utilized to address conflicts. Archaeological mitigation carried out for redevelopment of an African American church property exposed surviving portions of Fort Stevens, one of the Civil War Defenses of Washington which came under attack during Jubal Early's unsuccessful raid on Washington in 1864. Preservationists and the National Park Service strongly opposed redevelopment of the church property but found common interest with archaeologists investigating the site, extending the life of the project and reaching wider publics as a result. In a subsequent project, consultation surrounding a highly contested plan to develop the site of an early twentieth-century African American cemetery in Bethesda, Maryland brought archaeologists to the table with descendants and opponents of the project, who ultimately forestalled the project through protest and civil disobedience.

Panich, Lee (Santa Clara University), Tsim Schneider (University of California, Santa Cruz) and GeorgeAnn DeAntoni (University of California, Santa Cruz)

[214]

"By the Aid of His Indians": Native Negotiations of Settler Colonialism in Marin County, California, 1840–1870

The mid-nineteenth century was a crucial time for Native Californians. The Franciscan missions were secularized in the 1830s, but American annexation of California in the late 1840s ushered in the full brunt of settler colonialism. Within this milieu, many Indigenous people created social and economic ties with newcomers in order to maintain connections to their ancestral homelands. One such locale was Toms Point, a landform on Tomales Bay, where Coast Miwok people worked at a trading post run by an American entrepreneur. This poster will explore the material evidence for their engagement with a broad array of social and economic connections, including the California coastal trade, the salvage of local shipwrecks, and persistent Indigenous exchange networks. Materials from Toms Point will be contextualized with data from contemporaneous Indigenous sites in the region, including other Coast Miwok communities and sites occupied by neighboring Pomo people. Our results suggest that the residents of Toms Point, like other Native Californian communities, coped with settler colonialism by simultaneously engaging in emerging global markets and maintaining enduring Indigenous networks.

Pantel, Agamemnon and Chester Walker

[192]

Methodological Approaches to Search and Recovery of WWII MIA's

Some 78,000 U.S. service personnel are still official considered "Missing in Action" (MIA). From WWII, they are located in both the Pacific and European theaters. History Flight, a non-profit organization, has dedicated over 10 years to the search and recovery of these U.S. servicemen who are still MIA's through a transdisciplinary approach. Initial steps logically stem from archival data, including battle narratives, medical records, personal letters, aerial photography (from U.S. and enemy files), witness interviews, and local government authority records. These normally drive the parameters for the integrated application of systematic remote sensing, including Ground Penetrating Radar (GPR) surveys, magnetometer surveys, low level aerial surveys, and human remains detection dog (HRDD) surveys. The correlations of these data serve to focus the archaeological excavations. Through this transdisciplinary methodological approach, History Flight has successfully found and recovered over 200 U.S. servicemen in the Pacific and Europe over the last few years. Methodological modifications are required for the location and recovery of missing servicemen from aerial disasters, because they present different challenges and conditions than those for ground losses. Case studies from projects realized in the Pacific and Europe will serve as examples to demonstrate successful applications of this transdisciplinary approach.

Pape, W. Kevin (Gray & Pape Inc.)

[58]

The Art of Mid-Air Construction: Building and Sustaining the Business of CRM through the Lens of Gray & Pape Inc.

The business of cultural resources management was born out of entrepreneurial responses to passage of the National Historic Preservation Act and its implementing rule-making. Early CRM firms were established across the country as opportunities and markets quickly developed around the regulatory process. And without the benefit of a unifying business paradigm, each firm navigated its own path to success; the American Cultural Resources Association, created in the mid-1990s, would begin to influence the adoption of common professional and business practices. CRM was always conceived of as multidisciplinary, but that vision remains less than fully formed. CRM has been deeply influenced by its early roots in Departments of Anthropology and priorities driven by archaeological research. As the practice of CRM matures, signs point to the emergence of clearly divergent business strategies: one path following a more commodity based, transactional approach, another adopting a cultural heritage approach

which strives to integrate community voices and international heritage standards. Future trends in CRM will be driven by the creativity and perspective of new CRM leaders who will gain influence as CRM's founder cohort retires.

Paradiso, Emma (Colorado College) and Scott Ingram (Colorado College)

[214]

Untold Stories from the American Frontier: A Case Study of Historic Settlement Patterns in the Manitou Experimental Forest, Woodland Park, Colorado

This research seeks to understand the historic landscape of the Manitou Experimental Forest, near Woodland Park, Colorado, based on the archaeological findings of Colorado College students from 2017 until present. The research incorporates archaeological survey, dendrochronology, mapping, and documentation of historic cultural resources that date to the late 1800s. The research questions are "What is the human history of the Manitou Experimental Forest, ca. 1850 to 1950? Who lived there, when did they live there, and why were they there?" This research provides an opportunity to reconsider historic settlement patterns in Colorado and has allowed for a rich culture history of the Manitou Experimental Forest to emerge and become accessible to local residents and other researchers.

Parcero-Oubiña, César [224] see Murphy, Beau

Paredes Castro, Victor [268] see Silva Sifuentes, Jorge

Pargeter, Justin (NYU/University of Johannesburg) and Patrick Schmidt (Eberhard Karls University of Tübingen)

[216]

Simple Surface-Fire Heat Treatment Significantly Improves Silcrete Flake Quality and Flaking Efficiency

Intentional stone heat treatment is a key marker for prehistoric behavioral variability. Yet, the relationship between differences in heat-treatment strategies and variations in stone tool-making processes remains heavily debated and poorly understood. We report on two experiments testing wood fuels and heating strategies applied to silcrete nodules from ~60 km south of Diepkloof Rock shelter in South Africa with early evidence for intentional silcrete heat treatment. We flaked the heated silcrete nodules to maximize flake production. The resulting cores and flakes were compared in terms of their utility (flake cutting edge to mass) and cutting edge quality (cutting edge angles) in addition to quantifying woody residues and heat induced fracture rates. Our results show that simpler heat treatment strategies provide significant increases in small core utility and flake quality over larger unheated silcrete nodules. Some of these effects were obtained without more specialized knowledge than is required to maintain fires for cooking and other utilitarian purposes. Our results show that rapidly heating silcrete to modify rocks for stone tool production is efficient at relatively low levels of technological investment.

Paris, Elizabeth (University of Calgary), Roberto López Bravo (Universidad de Ciencias y Artes de Chiapas) and Gabriel Lalo Jacinto (INAH-Chiapas)

[54]

Economic Integration across Political Boundaries in Highland Chiapas

This paper examines the integration of small polity economies in highland Chiapas, and the ways in which polity size and proximity were factors. This region formed part of the western frontier of the Maya linguistic and cultural area, and has been characterized as a relatively autonomous economic and political periphery. Beginning in the Late Classic period, a network of small polities proliferated throughout highland Chiapas. We draw on our excavations at the multiple sites political centers in the Jovel Valley in the western Chiapas highlands, as well as our excavations at the larger center of Tenam Puente. We observe that economic integration between highland polities manifested more highly with respect to geographic distance as opposed to polity size, with a higher degree of economic integration between polities within the Jovel Valley; and a relatively low degree of economic integration between the Jovel Valley and Tenam Puente. Furthermore, we consider whether the degree of economic integration between polities shifted from the Late Classic to the Early Postclassic periods, as the sociopolitical turmoil of lowland Maya polities to the north and east began to affect long-distance exchange and alliance networks

Paris, Elizabeth [150] see George, Miranda

Paris, Elizabeth [168] see López Bravo, Roberto

Paris, Elizabeth [196] see Meanwell, Jennifer

Paris, Elizabeth [150] see Pacheco, Ellen

Paris, Elizabeth [203] see Williams, Megan

Parish, Ryan (University of Memphis) and Brian Rowe (University of Memphis)

[30]

Sourcing the Sacred: Provenance of Chert Mortuary Discs at the Hopewell Site

In order to ascertain the level of community involvement in the construction of the ritual landscape at the Hopewell Mound Group in Chillicothe, Ohio, the current study examines a sample of the mortuary chert disc cache recovered from Mound 2 via reflectance spectroscopy and EM-GMM cluster analyses. The two methods of analysis potentially provide a clearer image of lithic sources for the mortuary chert discs among the Ohio Hopewell people, and also highlight technological variability in the creation of the chert disc cache. Using analytical provenance data, multivariate statistical, and metric analyses it is possible to identify three regional groups or communities that were involved with the creation of the assemblage discovered at Mound 2. The provenance of the chert discs indicates that deposits of Ste. Genevieve and Upper St. Louis chert from southern Indiana, Illinois, and along the

Kentucky/Tennessee border were utilized by groups that contributed to the Mound 2 assemblage upon periodic trips to the site. The discovery provides a new understanding of Ohio Hopewell creation and use of sacred space.

Parish, Ryan [194] see Sherman, Simon

Park, Gayoung (University of Washington) and Ben Marwick (University of Washington)
[55]

Approximate Bayesian Computing for Modeling Patterns of Cultural Transmission in the Late Paleolithic of Korea

During the Late Pleistocene, the appearance of new technologies such as blades and points occurred in many locations, and at different times, raising questions about their origins and their diffusion processes. We consider the case of the Korean Upper Paleolithic, where stemmed points appeared as the first of several new technologies during the Late Pleistocene. There are competing theories about the origin of stemmed points and their dispersal as well as the role of social contexts in this process. Previous work on social contexts of transmission has demonstrated the effectiveness of Approximate Bayesian Computing (ABC) to infer patterns of cultural evolution based on artifact frequencies. ABC is essential here because it enables the evaluation of multiple competing evolutionary models formulated as computer simulations. We simulated a large number of social transmission scenarios by sampling from specified prior probability distributions and plugging them into a population dynamics model. We create a posterior distribution of artifact estimates, by keeping only those parameter values for which artifact metrics closely match the empirical data. We show that ABC is useful to infer parameters and choose between models in complicated scenarios such as cultural transmission models.

Park Boush, Lisa [59] see Beamer, Dawn

Parker, Adam, Mason Miller, Christopher Ringstaff, Brittany McClain and Timothy Griffith
[194]

Preliminary Analysis and Interpretations from Excavations at Site 41SR459, Starr County, Texas, USA

Archaeologists from AmaTerra Environmental, Inc. worked with their counterparts at the Texas Department of Transportation to conduct National Register of Historic Places-eligibility testing at Site 41SR459, a Late Archaic (2350–1350/1250 BP) and Late Prehistoric (1350/1250–700 BP) campsite located within the proposed impact corridor of a new roadway in Starr County in South Texas. The site investigations included documenting 18 distinct burned rock features, six of which were subject to manual test unit excavation. In addition, one backhoe trench was excavated to identify non-surface features and assess site formation and geomorphology. The artifact assemblage recovered through the excavations included 1,760 artifacts including lithic tools and debitage, burned rock, mussel shell, and a potential shell bead fragment. Citing the abundance and variety of artifacts recovered as well as the frequency of associated features, the site was determined eligible for listing on the National Register of Historic Places (NRHP) and will be subject to further investigation if avoidance is not possible. This paper will present a summary of the site and discuss preliminary interpretations from the investigations.

Parker, Candace
[63]

A Comparison of Sites within the Fourche Maline Archaeological Culture

This poster presents a comparison of several sites that are part of the Fourche Maline archaeological culture (ca. 2300–1100 cal BP). Fourche Maline sites tend to be located along or near the Fourche Maline Creek in the Wister Valley on eastern side of Oklahoma. Many of these sites were originally excavated by the WPA in the 1930s and 1940s; most containing dark-earth midden-mounds. Among other characteristics are thick, grog-tempered, flower pot-shaped pottery, variations of Gary projectile points, ground-stone objects, and various bone tools and other artifacts. The artifacts and excavation reports from 34LF33 (Troy Adams) were analyzed for this study and then compared to other previously analyzed collections of known Fourche Maline sites from Oklahoma. Some of the analyses conducted on this collection include a technological analysis of lithic tools, lithic raw material sourcing, as well as ceramic function, form, and various attributes relating to manufacture. This comparison was done to gain a better understanding of how the Troy Adams site fits into the greater Fourche Maline archaeological culture.

Parker, David [252] see O'Mansky, Matt

Parkinson, Jennifer [27] see Pobiner, Briana

Parkinson, William (Field Museum of Natural History and University of Illinois at Chicago)
[255]

Anthropology, Archaeology, and the Myth of Epistemological Independence: Copper Age Village Dynamics on the Great Hungarian Plain

For decades, Alan Sullivan has lobbied vigorously for the epistemological separation of archaeology from anthropology. Some see this separation as desirable, but others question whether it is possible. In this paper, I will explore Sullivan's plea for archaeological independence against the backdrop of the Copper Age in the Carpathian Basin. Specifically, I will focus on the Körös region of the Great Hungarian Plain to discuss diachronic models of settlement organization and relocation at multiple geographic and spatial scales. Using the rich dataset from this region to frame the argument, I contend (contra Sullivan) that it is impossible to separate archaeological models from anthropological ones. However, I agree with Sullivan that the models archaeologists historically have

created have been heavily influenced, and restrained, by a lack of congruence between ethnographic, ethnohistoric, and archaeological scales and datasets.

Parkinson, William [199] see Gyucha, Attila

Parr, Christopher (Virginia Department of Military Affairs)

[52]

"Well, We Found a Site . . . Now What?" Monitoring Cultural Resources at Virginia Army National Guard Facilities

The Virginia Army National Guard (VAARNG) manages over 700 archaeological sites and burial locations, and its inventory of cultural resources is always growing. The overwhelming majority of these resources are at the Fort Pickett Maneuver Training Center in south-central Virginia. For the VAARNG, it is challenging to effectively manage these resources in a 41,000 acre installation that has trained the equivalent of over 329,000 personnel in Fiscal Year 2019. Under the terms of a recent programmatic agreement, the VAARNG has agreed to protect its archaeological sites from land disturbance by means of protective barriers combined with periodic inspection every one, two, or five years. Systematic monitoring began in 2017, when the VAARNG documented baseline conditions of its archaeological sites and established a monitoring strategy utilizing photographic monitoring points. Consequently, the VAARNG has used the monitoring program to prioritize sites for protective barriers or further investigation. While overwhelming at first, the monitoring program has proven to be an essential management tool, and the VAARNG has applied monitoring efforts to its archaeological collection by initiating its first "wall-to-wall" inspection and condition assessment of its collection's inventory. The VAARNG will prioritize items for conservation, research, and even exhibition.

Parra, Manuel Reynaldo [101] see Gallaga, Emiliano

Parrott, Nathan (University of Calgary) and Armando Anaya Hernández (Universidad Autónoma De Campeche)

[178]

The Sakjol Marketplace of Yaxnohcah, Campeche, Mexico

Ancient marketplaces serve as invaluable sources of information regarding the political-economic organization of archaeological sites. Marketplaces were important locations within ancient cities serving as nexuses of social, economic, and political interaction. There is a rich collection of ethnohistoric, linguistic, and pictorial evidence indicating the existence of precolumbian marketplaces within the Maya region. Despite this, extensive research focusing on ancient Maya marketplaces has only just begun to develop relatively recently over the past decade. This project focuses on an unusual double-plaza marketplace at the Maya site of Yaxnohcah, Campeche, Mexico, the range of marketplace activities that took place and the construction history of the plazas. Analysis of materials recovered and the results of geochemical testing have provided valuable insight into the activities of the marketplace, in particular evidence of late-stage lithic production and cleaning practices.

Parsons, Jeffrey (University of Michigan)

[152]

Discussant

Parsons, Jeffrey (University of Michigan)

[181]

Discussant

Parsons, Ted (University of Alaska Anchorage)

[147]

Recent Developments in Small and Low-Cost 3D Scanning Systems

Small and inexpensive alternatives for capturing 3D data have continued to proliferate. Previous 3D capture systems included specialized Google and Sony smartphones, the Scanse Sweep, and the moderately expensive DotProduct DPI-8X handheld scanner. This poster examines developments in the low-cost scanner arena during the last two years with the introduction of smaller and cheaper devices. The new scanners operate on variations of the structured light principal used by the Microsoft Kinect for Xbox 360 (V1). In January 2018 Intel Corporation began selling new RealSense compact depth cameras as stand-alone sensors and as modules for incorporation into other devices. The RealSense D435 and D415 are evaluated, used in conjunction with DotProduct Dot3D Scan software and a small tablet computer. Occipital recently released the Structure Core bundled with the same Skanect software that allows the V1 to be used as a scanner. New also is Occipital's iPad-based Structure Sensor Mk II. Lastly, 3D Systems have incorporated a RealSense unit in their updated Sense 3D Scanner. The new scanners are USB powered, not needing a 110-volt AC electrical power source. The output of each of these new devices is compared to an Agisoft Metashape Professional photo model of a test object.

Partlow, Megan [59] see West, Catherine F.

Pascali, Pamela [270] see Peterson, Kateea

Pascual Soto, Arturo**[227]***El Tajín en tiempos de 13 Conejo: Expresiones de un nuevo estatuto simbólico (ca. 800–1100 dC)*

Si bien el culto al soberano no podría expresar de mejor manera el carácter sagrado que se le confería de antiguo y el extraordinario poder que se concentraba en su persona, es en El Tajín cuando evoluciona sobre las bases de una ideología de reciente introducción hacia una liturgia ligada a una tradición cultural que en el Epiclásico se estará extendiendo por Mesoamérica siguiendo el litoral del Golfo de México. Es justo a estos nuevos grupos políticos a quienes debemos de atribuir hacia el año 800 dC la construcción del imponente Edificio de las Columnas como también el desarrollo de un estilo artístico estrechamente ligado con la expresión de un nuevo estatuto simbólico. La ponencia explora desde la perspectiva de los monumentos promovidos por los gobernantes de la ciudad los cambios que se generan en el arte de El Tajín, los temas que aborda y el contexto político y social al que se vinculan dichas transformaciones.

Paspalas, Stavros [36] see Kardulias, Paul Nick

Passalacqua, Nicholas and Katharine Kolpan (University of Idaho)**[188]***Forensic Archaeological Fieldwork as a High-Impact Practice*

This presentation will discuss search and recovery efforts concerning an isolated, WWII-era burial from the Federal Republic of Germany. This was a partnership project between the Defense POW/MIA Accounting Agency (DPAA) and Western Carolina University (WCU); coordinated between DPAA, WCU, and various local officials. This presentation will provide a model for reimagining other, similar DPAA partnership projects as service learning and professionalization opportunities. The goal of this presentation is not only to summarize the findings of these search and recovery efforts, but to discuss the power of such collaborative projects as unique service learning, high impact practices (HIPs). HIPs are educational practices which emphasize learning through practice and reflection, and have been demonstrated to have positive associations to student learning and retention. Service learning projects are defined by their experiential learning emphasis, combined with collaboration between community partners, and participant reflection. The very nature of this collaborative partnership project provided the basis for its service learning structure. However, we argue this model also emphasized an atmosphere of professionalization not always encountered in field school contexts. This was because it allowed for student participants to take greater ownership of their work while being compensated as paid professionals.

Patch, Shawn (New South Associates Inc.)**[208]***Discussant***Patino-Contreras, Alejandro****[163]***The Ceramic Sequence of Tintal, Petén, Guatemala*

A ceramic sequence for the archaeological site of Tintal, in Petén, Guatemala has been established. The results of classification efforts undertaken between 2017 and 2019 make mention of ceramic types, varieties, and modes attested for a sample of collections from a number of different contexts documented through scientific site excavations. A sequence of six ceramic complexes spanning from the Middle Preclassic (from around the second half of the ninth century BCE) to the Terminal Classic. The study also illustrates a number of cultural connections between Tintal and other sites in the Mirador Basin. Preclassic, Late Classic, and Terminal Classic assemblages are relatively well represented in the study sample. In contrast, the Early Classic period has low visibility, yet this pattern is due to sampling issues. Deposits with Terminal Preclassic and Terminal Classic ceramics are common, strongly indicating an important occupation in Tintal during these periods. This paper addresses to present the ceramic sequence of Tintal and its relationship with other sequences in the area such as El Mirador, Nakbe, and Naachtun.

Patrick, Shelby (Colorado College) and Scott Ingram (Colorado College)**[165]***An Investigation of Stone Huts in Crestone, Colorado*

Outside of Crestone, Colorado, a group of stone huts have been the subject of local lore for many years. Despite the speculation surrounding the structures, there has been no conclusive determination of their function or origin. Theories as to the huts' purpose have ranged from ovens to storage units to ceremonial structures. Thoughts on who constructed the stone huts are just as varied. While some local community members believe the huts to be of Native American origin, others have suggested that they are associated with the mining or railroad industry boom that occurred in the San Luis Valley. Examination of historical documents, associated artifacts, analysis of the huts' architecture, and interviews with local community members aid in evaluating the evidence in support of these various theories. Ultimately, this project aims to gain a better understanding of the Crestone stone huts and their place in the larger San Luis Valley landscape.

Patterson, Donald (Tonkawa Tribe)**[113]***Discussant*

Patterson, John [203] see Kelly, Nigel

Patton, Katherine (University of Toronto), Dena Doroszenko (Ontario Heritage Trust) and Richard Gerrard (City of Toronto Museum and Heritage Services)

[228]

Off-Campus Archaeology: Teaching about the Past through Community Partnerships

We present a case study on a community-engaged learning course offered at the University of Toronto. The course partners students with government and community organizations to work on projects in heritage and archaeology, such as collections management and public outreach. Importantly, the course gives students experiential learning opportunities in non-academic settings. In this case study students worked with staff at the Ontario Heritage Trust and the City of Toronto's Museum and Heritage Services. In these contexts they could observe and begin to understand the real-world complexities that often surround heritage legislation and its implementation, while participating in operational aspects of stewardship of collections, and historic sites and monuments management. Through this, students also engage with how historical narratives are generated, presented, and contested.

[228]

Chair

Patton, Natalie, Wyatt Benson (Northern Arizona University), Mitchell Cleveland (Northern Arizona University), Eric Gilmore (Northern Arizona University) and Olivia Fry (Northern Arizona University)

[148]

Bone Pliability and Its Importance to Bone Awl Manufacture: An Experimental Archaeology Study

Zooarchaeological analysis of bone tools allows for the reconstruction of human and animal interactions in the past. One example of animal use in the American Southwest was the modification of their skeletal elements into tools, such as awls and needles, personal ornaments, or instruments. Bone artifacts recovered from Wupatki National Monument, previously analyzed by the authors, were employed to investigate the steps necessary in the manufacture of bone awls. Several elements of the manufacture process are unfortunately elusive to experimental archaeologists. To explore the gaps of manufacturing technique, our poster examines different methods useful for improving the pliability of bone for modification, and different grains of dry or wet sandstone employed to shape and sharpen the tips of the awls. Our research improves the power of our interpretations and allows archaeologists to further explore the cultural contexts within which bone awls were created in the American Southwest.

Pauketat, Timothy (University of Illinois)

[46]

Looking to the Heavens to Rediscover the Human Element

A lifetime of archaeological research and travels into the culturally specific practices and ambiguously meaningful objects of past peoples leads me to seek out the non-human elements of relations that, counterintuitively, make us all human. Archaeologists today may feel uncomfortable with some general explanations since the human beings in our studies were, of course, culturally unique. Yet we should not overlook the realities of our cases that enable us—as sentient beings ourselves—to understand broad historical relationships between things, beings, and phenomena, and that allow us to transcend cultural barriers. Thus, for instance, the properties of stone, earth, and water helped to produce the first cities. So did those of light, shadow, and celestial movement. Indeed, in this talk I look to the heavens to rediscover the human element.

Pavel, Rosemarie (Logan Simpson)

[214]

The Women of the Adobe Castle: An Archaeological Investigation at Bent's Old Fort National Historic Site, La Junta, Colorado

Between 1833 and 1849, Bent's Old Fort in present-day southeastern Colorado was a significant location for cross-cultural trade on the Santa Fe Trail amongst New Mexicans, Euro-Americans, and Southern Cheyenne and Arapaho tribes. Existing historical and archaeological investigations of the fort have focused on the lives of male traders, trappers, and soldiers. Archaeology in the American West has begun to identify gender in the archaeological record, and Bent's Old Fort is an important venue for this research. As archaeologists, we stress the importance of recording and curating artifacts for future study and analysis by later scholars with different research interests. This study shines a light on the importance of this principle, and a critique of how this has been applied in the past.

Pawlowicz, Leszek [230] see Hoggarth, Julie

Payne, Neal (Simon Fraser University)

[35]

Investigating Identity through the Regional Foodscapes of Roman Britain

For over a century theoretical approaches to Roman colonialism have been dominated by the notion of Romanization, a model based on top-down homogeneous cultural change occurring in Britain during the immediate post-conquest period. However, the pre-Roman population was not a homogeneous group. Exploring the plurality of these groups' identities has been neglected due to the lingering legacy of Romanization, resulting in limited attempts to explore this diversity. My poster presents the application of a new theoretical framework based on the concepts of foodscapes, material entanglement, and post-colonial theory (discrepant identity) to analyze the wealth of previously published archaeological material concerning food consumption in Roman Britain. I draw on the previously published archaeobotanical, ceramic, isotopic, related material culture, and zooarchaeological material, to situate

the extent of regional differences exhibited by the diverse groups living under Roman occupation. The goal of this research is twofold. First, to identify regional differences in the local reaction to Roman colonialism. Second, to demonstrating the potential of situating archaeological research within a holistic foodscape framework.

Payntar, Nicole (University of Texas at Austin), Wei-Lin Hsiao (University of Texas at Austin), R. Alan Covey (University of Texas at Austin) and Kristen Grauman

[175]

Detecting Patterned Tourist Movement and Photography Using Geotagged Images of Archaeological Heritage Sites in Cuzco, Peru
The intersection of social media and heritage tourism in recent decades has created an abundance of open-source imagery that remains underutilized by the archaeological heritage community. This data is largely driven by consumer (i.e., tourist) experiences and the promotion of visually aesthetic heritage landscapes by various stakeholders. As images of heritage sites are catalogued and shared across media platforms they provide archaeologists with new opportunities to understand how the intensification of tourism intersects with archaeological heritage regulations and social media, aiding in the articulation of travel patterns across heritage landscapes. Image analysis permits the assessment of how aesthetic preferences and visuality become entangled with the rapidly evolving expectations of tourists, whose travel narratives are often grounded in historic site representations. Using Cuzco, Peru as a case study, we collected 57,804 publicly geotagged images posted by 2,261 Flickr users between 2004 and 2019. These images and their accompanied meta-data (timestamps, geotags, etc.) were then processed using machine learning and computer vision algorithms to identify travel patterns across a known archaeological heritage circuit (Boleto Turístico del Cuzco) and quantify visual culture and experiences in the Cuzco region. This paper presents the results of our research.

Payntar, Nicole [17] see Covey, R. Alan

Pazmiño, Estanislao

[201]

Cochasquí: Celebrando el agua de los ancestros

Durante la época prehispánica, los Andes septentrionales albergaron una intensa interacción cultural que conllevó al surgimiento de centros monumentales cuya función ha sido poco discutida. Particularmente durante el Periodo Tardío comprendido aproximadamente entre el 600 y 1525 dC se evidencia una transformación de los sistemas políticos y el surgimiento de centros monumentales. La construcción de plataformas piramidales y montículos funerarios al parecer están vinculadas a una fuerte tradición de culto a los ancestros y su relación con el agua. Precisamente, Cochasquí se erige durante este periodo como uno de los centros monumentales más importantes de la región. En el presente trabajo se discute la relación entre las edificación monumentales de Cochasquí y una larga tradición de culto al agua y los ancestros.

Peacock, Claude [237] see Peacock, Evan

Peacock, Evan (Mississippi State University), Virginie Renson (Archaeometry Laboratory Research Reactor Center), Brenda Kirkland (Mississippi State University), Simon Sherman (University of Memphis) and Claude Peacock

[237]

Elemental and Isotopic Geochemistry of Freshwater Shells to Source Shell-Tempered Ceramics

The aim of this research project is to evaluate the efficacy of elemental and strontium isotope analysis to contribute to our knowledge of shell-tempered ceramic circulation and exchange. It builds on recent pilot studies showing that freshwater mussel shells recovered at archaeological sites located in different drainages present different elemental compositions. Here, a combination of elemental and strontium isotopic analyses is applied to whole freshwater shells and shell temper fragments extracted from shell-tempered ceramics. The method is tested at the basin scale, with samples selected from twelve sites in or adjacent to the Yazoo Basin (Mississippi). The sites are located along multiple drainages and date from the Late Woodland and/or the Mississippian period. Both methodological approach and results are presented and the following aspects are discussed: the evaluation and the impact of diagenesis, the identification of discriminant elements and the variability of elemental and isotopic geochemistry signature within the basin, the comparison of geochemical signatures of shell temper and whole shells, and the possibility of chemical exchanges between the clay and the shell temper.

Pearson, Charlotte (Laboratory of Tree-Ring Research)

[24]

What Does Annual Tree-Ring ^{14}C Offer for Chronological Synchronization and Calibration?

Tree-rings offer the potential for accurate, annually dated time-lines against which to compare the events of the stratigraphic record. They may also offer a regional climate record against which to evaluate cultural response. But tree-ring records are limited to certain regions and time periods. Only in a few select locations do they extend back beyond 8,000 years. Recent research has demonstrated that the annual measurements of radiocarbon captured in tree-rings from these few important chronologies could offer significant new opportunities for anchoring multiregional timelines and making radiocarbon calibration more accurate. This talk will provide some examples of the use of tree-rings to refine the dating of archaeological sites, review work in progress using annual ^{14}C and consider some of the potential limitations and opportunities to arise for chronological synchronization and calibration using annual ^{14}C records.

Pearson, Kristen (Harvard University)**[62]***In Someone Else's Shoes: Ethnoarchaeology at the Intersection of Life and Object Histories*

In Mongolia, ethnoarchaeological methods have been applied productively to questions of mobility, spatial organization, site formation, and animal husbandry practices, among others. An area that remains to be explored is the application of ethnoarchaeological methods to the study of craft production, particularly as it relates to distinctive local resources, ecologies, and mobile lifeways. In this paper, I present the results of ethnoarchaeological fieldwork focused on craft production in organic—specifically animal-based—materials. By studying contemporary craft practices and their material manifestations, I aim to construct an interpretive framework for the organic archaeological record that relates object histories to the life histories of individuals. By placing objects in their social and environmental contexts, their relevance to key social and environmental questions becomes apparent. This is demonstrated by a case study of archaeological hide and textile objects from the tenth-century cave burial of Üzüür Gyalan.

Peck, Katherine (University of New Mexico), Noa Lincoln (University of Hawai'i) and Michael Graves (University of New Mexico)**[252]***Soil Nutrient Variability in the South Kohala Field System, Hawai'i Island*

The uplands of Kawaihae 1 ahupua'a, Hawai'i Island, contain a dense dryland field system built, utilized, and occupied by Hawaiians from as early as the seventeenth century into the nineteenth—early twentieth century. This field system contains a diverse array of agricultural practices including fixed-field agriculture, planting mounds, terracing, and water management features such as 'auwai (irrigation ditches) and check dams. In order to investigate this field system's past and present agricultural potential—particularly in light of the landscape's aridity—we sampled soils along an elevational transect through a portion of the field system. These soils were then described and analyzed for a suite of values including resin extractable phosphorous, cation exchange capacity, total elements, base saturation, pH and soil moisture. These results and their implications for soil development, geomorphology, and agricultural viability within this archaeological landscape are discussed. The latter is of particular interest to the Kailapa Community Association, which includes members of the Kawaihae descendant community, who are interested in managing this upland area.

Pecora, Albert [188] see Burks, Jarrod

Pedro Black, Marielle and Sandra Arazi-Coombs (Cibola National Forest)**[148]***The Use of Stone Axes in North-Central New Mexico on the Cibola National Forest Sandia Ranger District*

Stone axes found on the northern portion of the Sandia Ranger District are as numerous as those found during excavations of the nearby site of Paa-ko. Paa-ko is a prehistoric/protohistoric village site located in a similar pinyon-juniper environment within 7 miles of the study area. Like those found in Paa-ko, the majority of the axes found on the Sandia Ranger District are broken and could no longer be used for the intended purpose. Previous studies of stone axe use in the Prehistoric Southwest have hypothesized the use in resource procurement as axes or hoes based on environmental conditions. Hypothesized uses include digging, chopping, and processing activities, specifically focused on agriculture and the use of trees. Less often stone axes are considered tools in prehistoric mining. Geoenvironmental conditions specific to the study area must be considered, specifically the presence of copper and turquoise in the region. In contrast to traditional axe uses posited in the past that emphasize agricultural, tree procurement, processing, and ceremonial uses; we suggest that uses as mining tools must be considered.

Peebles, Matt (Arizona State University)**[29]***Networks, Community Detection, and Critical Scales of Interaction in the U.S. Southwest/Mexican Northwest*

Archaeologists have long recognized that spatial relationships are an important influence on and driver of all manner of social processes at scales from the local to the continental or even beyond. Recent research in the realm of complex networks focused on community detection in human networks suggests that there may be certain critical scales at which human spatial interactions can be partitioned, allowing researchers to draw boundaries that provide new insights into a variety of social phenomena. Thus far, this research has been focused on short time scales and has not explored the legacies of historic relationships on the evolution of network communities and boundaries over the long-term. In this paper, we examine networks based on material cultural similarity drawing on a large settlement and material culture database from the U.S. Southwest/Mexican Northwest (ca. AD 800–1800; encompassing over 1,000,000 km²) divided into a series of short temporal intervals. With these temporally sequenced networks we: (1) explore the utility of several methods of network community detection, (2) evaluate whether there are key phase transitions in the scales of network communities, and (3) explore the role of previous network configurations in the evolution of network communities through time.

Peebles, Matt (Arizona State University)**[116]***Discussant*

Peebles, Matt [120] see Oas, Sarah

Peebles, Matt [123] see Torvinen, Andrea

Pelletier, Maxime [36] see Holliday, Trenton

Pelton, Spencer (University of Wyoming)**[68]***Does Temperature Influence Folsom Stone Tool Variability?*

Hunter-gatherer archaeologists argue that stone tool kit variability is influenced by a several common boundary conditions, including raw material availability and package morphology, mobility and subsistence, and others. I argue that ambient temperature should be included alongside other boundary conditions as a primary influence on stone tool kit variability by a) influencing stone tool types, and b) structuring time budgets. Drawing data from the Folsom archaeological record of the Great Plains and Rocky Mountains, I demonstrate significant relationships between mean annual temperature and several Folsom tool kit attributes. I ultimately argue that temperature should be used as a means of understanding stone tool kit variability at large scales for hunter-gatherer records in temperate and cold regions.

Peña, Jose [105] see Cuello del Pozo, Paloma

Peña, Jose [242] see Chavez, Mark

Peña, Jose [240] see Kaul, Urvi

Peña, Jose [242] see Ritter, Alexandra

Penfil, Rachael (University of Illinois at Chicago)**[260]***Integrated Neighborhoods: Architectural Perspectives on Community at Mauka Llacta de Nuñoa, Puno, Peru*

To date, most archaeological research focusing on the Late Intermediate Period in the Lake Titicaca Basin has described this time as bellicose and sociopolitically fractured. Surveys have thoroughly investigated regional alliances and life in fortified hilltop settlements known as pukaras, but comparatively little work has explored non-defensive settlements or the processes of daily life that integrated these villages, many of which housed hundreds or thousands of residents. In this paper, I examine the site of Mauka Llacta de Nuñoa, an unfortified town located in the northern Lake Titicaca Basin containing over 400 domestic structures. Pilot research suggests that the settlement was home to at least two contemporaneous populations, marked by the presence of two types of residential architecture. These two types of architecture do not neatly cluster in separate areas, suggesting that different populations living at the site were more sociopolitically integrated than might be expected. Using survey and surface data, I present preliminary interpretations of neighborhood communities at Mauka Llacta and explore how socioeconomic ties—rather than just defensive concerns—may have been crucial for the integration of a diverse settlement in a sociopolitical context widely considered to be violent and divisive.

Peniche May, Nancy [197] see Volta, Beniamino

Pepe, James (Janus Research)**[193]***North Woodlawn Cemetery: CRM and the Legacy of Jim Crow*

North Woodlawn Cemetery served Fort Lauderdale's African American community during the period of legislated racial segregation. In the 1960s, part of the cemetery was purchased by the State of Florida and incorporated into the Right-of-Way (ROW) for Interstate 95. In 2012, Janus Research began working with the Florida Department of Transportation (FDOT) on possible improvements in the vicinity of North Woodlawn. A major part of this research involved ascertaining if unmarked graves were present within the I-95 ROW. An assumption of project archaeologists and planners was that local citizens would welcome the excavation of remains from the ROW for reburial within extant cemetery boundaries. Public outreach soon made it obvious that this view was not shared by the local community. Through continued consultation between FDOT, the Florida State Historic Preservation Officer, Janus Research and local stakeholders, creative methods for investigation and preservation at North Woodlawn were reached. Field methodology was limited to remote sensing techniques, including use of a cadaver dog, ground-penetrating radar (GPR), and radar tomography. Extensive interviews with local informants were an important component of the investigation. In the end, project engineers, State planners, local politicians and community activists were able to collaboratively achieve mutual project goals.

Perales, Manuel**[200]***Macahuisa in Hatun Xauxa: State Infrastructure, Mitmaquna, and Sacred Landscape in the Negotiation of the Inca Occupation in Jauja*

Different investigations have shown that during the process of expansion of Tawantinsuyu, the Incas promoted the cult of certain wakakuna like Pachacamac, as a strategy to legitimize their power over conquered populations. In the case of Pariacaca, the famous waka from the regions of Huarochiri and Yauyos, new readings of early written sources and current archaeological data suggest that their prestige and fame would have been, also, as the result of a state sponsorship, possibly driven from the Inca settlement of Hatun Xauxa in Jauja, through the promotion of the devotion to Pariacaca's son, Macahuisa. This fact would have been the result of a complex negotiation process between the rulers of Cusco and the local societies, which resulted in the design and construction of new infrastructure, the resettlement of different human groups under the condition of mitmaquna, and the resignification of landscapes in the framework of a new form of sacredness. All this led, ultimately, to the successful affirmation of the Incas' domain in one of the most economically important territories of their empire.

Peraza Lope, Carlos [20] see Glumac, Bosiljka

Peraza Lope, Carlos [138] see Masson, Marilyn

Perdikaris, Sophia (University of Nebraska, Lincoln), Rebecca Boger (Brooklyn College, CUNY), Sandrine Grouard (Natural History Museum, Paris), Edith Gonzal (Graduate Center, CUNY) and Jennifer Adams (University of Calgary)
[252]

Disrupted Identities and Cultural Heritage in Barbuda, Lesser Antilles

The island geography of Barbuda, West Indies, is fundamental to Barbudan cultural heritage, identity, and modern culture. Because of its thin soils and semi-arid climate, it was not developed for sugar cane production like its sister island, Antigua, and many other islands in the Caribbean. Although enslaved, Barbudans were able to develop subsistence strategies that leveraged the natural resources and ecology of the island. A network of wells was dug with troughs surrounded by walled-in areas and pens designed to provide water and capture free-roaming cattle to kill, especially during the dry seasons. The island was divided into areas for hunting, living, and agriculture, and the people managed the areas sustainably in the 1700s, 1800s, and into the 1900s. In this presentation we will discuss identity through an in-depth analysis of landscape and material culture.

Peregrine, Peter (Lawrence University and the Human Relations Area Files)

[254]

Resilience to Nuclear Winter: An Example of Policy-Focused Archaeological Research

In June of AD 536, an atmospheric event occurred that blocked the sun in the Northern Hemisphere for 18 months. This disastrous event was followed by another in AD 541. The combination of these events disrupted the climate for at least a decade. The AD 536/541 events created conditions eerily similar to the hypothesized climatic effects of a "nuclear winter." Because of its similarity to a "nuclear winter," the atmospheric events of AD 536/541 provide the opportunity to explore empirically the potential social impacts of a limited nuclear war. In addition, because some societies survived the AD 536/541 events, analysis of the AD 536/541 events provides an opportunity to develop and evaluate models of resilience to "nuclear winter." I pitched this idea to the Army Research Office and explained that using archaeological data I could provide the Department of Defense with policy recommendations for actions to enhance the United States' resilience to a possible "nuclear winter." In this paper I outline the history of this project and its initial findings in order to illustrate how we can educate government agencies that knowledge of the past can inform contemporary issues.

Pereira, Grégory [20] see Quezada, Osiris

Peres, Tanya (Florida State University)

[118]

Discussant

Peres, Tanya [76] see Schultz, Julian

Perez, Carlos [239] see Martinez Milantchi, Maria Mercedes

Perez, Daniel (University of Nevada, Las Vegas) and Karen Harry (University of Nevada, Las Vegas)

[142]

Virgin Branch Puebloan Adaptations on the Colorado Plateaus: Recent Excavations at Granary House (AZ A:14:46)

The upper reaches of the Virgin Branch Puebloan region—particularly, the western Colorado Plateaus—has largely remained understudied, partly resulting from difficulties accessing many areas yielding cultural activity. While the majority of data collection has been amassed through surveys, excavations on the western Colorado Plateaus have significantly broadened the archaeological record within this zone of the Virgin region. In particular, recent excavations—undertaken by the Department of Anthropology, University of Nevada, Las Vegas—have contributed to a greater understanding of adaptation strategies, subsistence, and chronology within late prehistory. Framed by excavation data from Granary House (AZ A:14:46), this paper presents preliminary findings regarding the Virgin Branch Puebloan occupation of a hamlet site on the southern portion of the Shivwits Plateau. On the basis of collected flotation and various artifact data (lithics, ceramics, and ground stone)—and coupled with chronometric data—inferences and implications are presented regarding occupational strategies and regional interactions within this remote portion of the American Southwest.

[142]

Chair

Perez, Daniel [142] see Van Alstyne, Benjamin

Perez, Gary, Joe Tellez (Professional Geologist), Alfred Alaniz (San Antonio College) and Janet Stock

[16]

Pictograph Iconography and Geologic Realities at 41VV124, the White Shaman Mural

The White Shaman Mural, a Pecos River style (PRS) rock art site located in a Pecos River tributary canyon, is dated from 2420 ± 80 to 1460 ± 80 RCYBP (radiocarbon years before present). At that time, prehistoric indigenous hunter-gatherers inhabited this semiarid environment and traveled seasonally to obtain resources. Research indicates the mural represents cumulative knowledge and not solely artistic expression. Some icons may be spiritually significant or narrative. Others appear to represent survival resources. One particular icon seems to represent four fountain springs of the South Texas Balcones Escarpment. These springs issue from the Edwards Aquifer and exist where hydraulic pressure is sufficient to force water up through wells and faults. Research indicates their importance prehistorically, historically and currently. We tested the hypothesis that these icons represent a resource

map of South Texas using Geographic Information Systems and research of historical records of indigenous/European contact. The creators seem to have established relative distance between the four springs measuring elapsed travel time. They accurately painted fountain spring icons on the mural spaced according to transit time. Results of the research have implications for current and future PRS rock art interpretation.

Pérez, Ventura (University of Massachusetts, Amherst)

[131]

A Four-Field View in an Increasingly Myopic World

Our scientific perspectives of the world are bound to moments of clarity. Clarity comes from the realization that the questions worth asking are the ones that illuminate the human experience while understanding positionality and privilege in the exploration of those questions. As a M.A. student, Dr. Martin encouraged me to develop a methodology that combines microscopy of cutmarks with detailed taphonomic reconstruction of each category of bone damage. She pushed me into asking questions that moved me far beyond the "checklist" osteology of trauma pattern recognition. I developed a methodology that allowed me to contribute to our understanding of the human arrival and occupation of Madagascar while at the same time exploring the concept of "evil" as an ideological construction of a moral imperative as it relates to violence. This paper surveys human bone assemblages around the world and throughout time to analyze the complexity, variability, and ambiguities surrounding the processing of human remains. The emphasis is on problematizing and challenging prominent discourses on violence by using a trans-temporal analysis of performative violence. It also explores consequences of the discourses in which we, as anthropologists, engage in both academia and media as we celebrate Dr. Martin's mentorship.

Pérez, Ventura [131] see Ralston, Clair

Pérez Cubas, Kelita [21] see Osborn, Jo

Pérez Cubas, Kelita [125] see Weinberg, Camille

Perez-Robles, Griselda (Universidad de San Carlos de Guatemala)

[209]

Discussant

Perrotti, Angelina (Arkansas Tech University), John Williams (University of Wisconsin), James Russell (Brown University), Stephen Jackson (Southwest Climate Adaptation Science Center) and Christopher Kiahtipes (University of South Florida)

[235]

First Americans, Megaherbivores, and Climate: Dung Fungal Spore Data from 8 Eastern U.S. Sites

New proxy evidence such as dung fungal spores contribute to continued efforts to disentangle interactions among Late Quaternary megaherbivores, vegetation, and people. Recently, the potential for dung fungal spores to reveal more precise timing of functional and final extinction events has resulted in research focused on the effects of megaherbivore extinctions, rather than solely exploring the causes. This paper uses new dung fungal spore data alongside existing pollen and geochemical records from eight sites ranging from the Great Lakes to the Gulf Coastal Plain to explore questions regarding both causes and effects of these extinctions, as they relate to the early migration of humans into North America. The results reveal the complex interactions of climate change, megaherbivores and their extinction, humans, and Terminal Pleistocene landscape change in the Eastern U.S.

Perrotti, Angelina [8] see Dozier, Crystal

Perry, Jennifer [160] see Hoppa, Kristin

Perry, Megan [80] see Taylor, Corinne

Person, Dylan (University of Nevada, Las Vegas) and Barbara Roth (University of Nevada, Las Vegas)

[6]

Shattering the Silicate Ceiling: Engendered Perspectives on Women's Production Management in the Mimbres Mogollon

Almost 30 years have passed since Gero challenged lithic researchers to reformulate technological arguments in a more appropriate framework than the hyper-masculinized version available at the time. Adopting this engendered view of the archaeological record has resulted in significant advances in how we view past divisions of labor, especially when highlighting the importance of women's work in the past. Building on this direction, we draw on Pueblo ethnographic analogy to conceptualize Mimbres Mogollon women as producers of finished goods and managers of raw materials brought into their village. This division of labor correlates well with logistical organization seen in Archaic forager models, which show a similar patterning of men and women's tasks and spheres of productive control. Our study uses data from the Harris Site in the Mimbres Valley, NM where increasing agricultural reliance resulted in a flexible but discernible division of gendered space. We examine artifacts from roofs, floors, and other behaviorally significant contexts to identify instances of gendered manufacture and use of lithic tools. These data are interpreted to provide an engendered view of material production at the Harris Site that provides a fuller picture of daily life in the Mimbres Mogollon Late Pithouse period.

Pestle, William (University of Miami), Carmen Laguer-Díaz (Valencia College), M. Jesse Schneider (University of Miami), Megan Carden (HistoryMiami Museum) and Daniel Koski-Karell (National Institute of Archaeology, Washington DC)
[271]

The First Man Gets the Oyster, the Second Man Gets the Shell: Assessing Models of Marine-Based Subsistence in Pre-Arawak Southwestern Puerto Rico

The Subtropical Dry Forest of southwestern Puerto Rico is home to numerous pre-Arawak sites, in particular shell-middens that evidence centuries, and even millennia, of marine-based subsistence activities of the island's first human inhabitants. In this work, we compare the malacological assemblages from two pre-Arawak sites in the municipio of Cabo Rojo with predictions generated by optimal foraging models of nearby marine habitats. This work aims to characterize the ecological and economic dimensions of ancient foraging behaviors and decision-making in the region. The Ortiz site, located in the barrio of Boquerón, dates to ca. 2300–1600 cal BC, while the CRNWR_P13 site, located 7 km south in Llanos Costa, is roughly a millennium more recent, dating to between 800 cal BC and cal AD 100. Deposits from both sites yielded abundant malacological remains (tens to hundreds of kilograms of marine shell) from largely intact midden deposits. Our taxonomic, edible weight, and habitat-based analyses reveals intriguing intersite differences (attributable to differences in chronology and/or nearby littoral habitats) and unanticipated evidence of intrasite diachronic change in subsistence practice/preference. Tantalizingly, at least some of these changes may be a consequence of behavioral adaptations to changing sea levels of the middle to late Holocene.

Peter, Duane (DP Heritage Consulting)

[154]

Discussant

Peters, Ann (University of Pennsylvania Museum)

[21]

Tracing Relationships over Time: Models of Exchange in the Greater Ica Region during the Paracas-Nasca Transition

Research on the 'Paracas Necropolis' textile assemblage from the Necropolis of Wari Kayan and comparisons with contemporary artifacts has led to the development of models of artifact production and uses (*chaîne opératoire*), with evident implications for models of the social relations of production. The processes considered include the procurement of component materials, the acquisition of production skills, a diverse array of crafting practices, the pragmatic, social, and ritual uses of the artifact and its final—or not so final—deposition in a cache or mortuary context. Relationships of form, both within and across classes of artifacts, imply social contact and the exchange of ideas, labor, artifacts, and people. I look at intersections between these two analytic approaches to develop a model of social relations of production and exchange that structured—and were transformed by—the Paracas-Nasca transition.

Peters, Kara (Pennsylvania State University) and Briana Pobiner (Smithsonian National Museum of Natural History)

[76]

Creating a Standardized Method for Accurate and Precise Measurement of Butchery Cut Marks: Digital Caliper, Scanning Electron Microscope, or Dino-Lite Microscope?

The use of reliable methods for metric analysis of bone surface modification are important in identifying the agent responsible for these modifications. Butchery cut mark analysis has traditionally employed the use of calipers and the scanning electron microscope (SEM), but recent expansion of this tool kit to more easily accessible tools, such as the Dino-Lite microscope, highlights the lack of method standardization and welcomes critical analysis. This study assesses precision and accuracy (i.e., closest to the overall mean of all data points) of digital calipers, SEM, and Dino-Lite as tools for two-dimensional measurement of cut marks, while also taking resource availability and efficiency into consideration. Length and width of twenty-four conspicuous cut marks on twenty-four experimentally butchered deer limb bones were repeatedly measured, with measurements taken from three subjects: bone, silicone molds, and silicone casts. Results suggest that the SEM is most precise, and that while digital calipers performed similarly regardless of subject, the use of molds significantly increases precision and accuracy for the Dino-Lite. When availability and efficiency are considered and certain protocols are followed, including use of angled lighting and a sturdy microscope stand, we advocate for the combined use of the Dino-Lite and molds.

Peterson, Katea (CAMAS), Pamela Pascali (CAMAS, Idaho State University), John Dudgeon (CAMAS, Idaho State University), Samantha Blatt (Idaho State University) and Amy Michael (University of New Hampshire)

[270]

Evaluating the Theoretical and Methodological Bases for Taphonomic Alterations in Biominerals

Physical and chemical alteration of bone in archaeological depositional context is a well-studied but poorly integrated field. Empirical generalizations derived from inhumation experiments and descriptive archaeological studies have made major strides in producing test explanations for alterations that can and do occur in buried bone, but understanding the mechanistic processes acting on biominerals in a model-based framework is lacking. Here, we present a model-based approach for taphonomic alteration which explores the influence of precisely controlled experimental parameters as proxy mechanisms (temperature, humidity, pressure, pH and matrix composition) to measure the mode and tempo of diagenetic change in histological context. We apply this experimental approach to modern human teeth from dental extractions and analyze the alterations by means of SEM-EDX, ATR-FTIR and LA-ICP-MS to compare predicted and observed changes in tooth enamel and dentin within a simulated burial context. We employ a geographic information system to visualize elemental uptake, incorporation and replacement through these dental tissues to create representative maps of elemental diffusion. We will present a classification of taphonomic alteration for evaluating biominerals recovered from archaeological and forensic contexts and to reliably distinguish diagenetic from biogenic histological processes.

[270]

Chair

Peterson, Kateea [120] see Rakowski, Rebekah

Peterson, Ryan and Amy Johnson (IDNR-DHPA)

[167]

Bethel Cemetery Reburial, Agency, and Stakeholder Coordination

The Bethel Cemetery excavation required extensive coordination with a number of agencies. Both the Division of Historic Preservation and Archaeology (SHPO) and the State Revolving Fund provided regulatory oversight. The scientific investigation was completed under Section 106 of the NHPA and Indiana Code (14–21–1), which allows for the archaeological relocation of human remains that predate January 1, 1940. While not specifically required under the law, extensive efforts were made to engage descendants, veteran's groups, the preservation community, and other interested parties. Outreach culminated with a rededication ceremony at Concordia Cemetery, the new resting place of those interred in the Bethel Cemetery. The cemetery was reconstructed in a compressed space, but remained respectful of family groupings. When possible, burials with monuments that were damaged or buried were re-associated with the proper grave. In some cases, the identities of individuals in unmarked graves could be determined. Graves of the unidentified were provided markers with unique identifiers that correspond with the report, so that in the future family members and researchers will have access to the extensive information that was compiled for each burial. The project resulted in extensive documentation and research while maintaining the utmost respect for the deceased.

Peterson, Ryan

[202]

Archaeological Site Preservation and the Impact of Noninvasive Archaeological Methods on a Global Scale

During the middle of the twentieth century, cultural resource management (CRM) emerged as a major industry worldwide. Internationally, different countries took their own approach as to what this management would entail. In many countries, the creation of the CRM industry led to an increase in invasive archaeological methods aimed at not only the salvage of archaeological sites, but also to drive the surveying and recording of new sites. In order to aid in the increase in scale and productivity of this increase in site excavation, CRM specialists around the world have turned to incorporating noninvasive methods. Improvements in technologies surrounding remote sensing and spatial mapping have created both alternatives to physical excavations and more precise excavations, with smaller amounts of physical disturbance to the archaeological record. This has allowed CRM specialists to monitor and record vast heritage sites with little disturbance. The extent and diversity of noninvasive methods employed has varied in CRM around the world. This paper utilizes interviews with CRM professionals from around the world to explore how these noninvasive archaeological methods and techniques are influencing how CRM is being practiced in different countries. The paper also seeks to highlight common trends in CRM worldwide.

Petras, Elysia (Temple University) and Leslie Reeder-Myers (Temple University)

[172]

Ethical Considerations of Using Museum Collections to Teach in a University Setting

Like many universities, the Temple University Laboratory and Museum houses ethnographic and archaeological collections acquired from faculty research, private donors and donations from other museums. Each collection brings a unique set of concerns. This paper presents on the ethical considerations of some of the collections, and how these are negotiated while using the collections to teach in a university setting from the authors' perspectives as both a student and an instructor. We specifically address issues related to teaching with poorly catalogued collections, collections of indigenous materials or materials from vulnerable populations, and legacy collections. Working under the constraints of limited resources, this presentation highlights teaching approaches which balance value of student learning with responsibility to source communities and other relevant ethical concerns.

Petrie, Cameron (University of Cambridge) and Adam Green (University of Cambridge)

[48]

Cities, Towns, and Villages in the Diverse Environments of the Indus Civilization

The urban phase of South Asia's Indus Civilization (ca. 2600–1900 BC) does not offer simple parallels to other contemporary complex societies. This paper will present new insights into Indus settlement networks and the diversity of Indus urbanism. There were apparently only four large scale (80+ha) Indus settlements, which were polycentric, with walls and platforms demarcating distinct zones, and characterized by large- and small-scale public and private buildings, heterarchical social structures, communal activities and collective action. These cities were considerable distances apart and situated in different ecological zones within the greater region occupied by Indus populations, and the majority of the population appears to have lived in medium- and small-sized rural settlements in the intervening areas. Significantly, it appears that urban and rural dynamics took different forms in each region, and Indus cities and the relationships with their rural hinterlands transformed over time. There is evidence for different interactive dynamics in "upstream" and "downstream" locations in the Indus River Basin, and settlement instability and population mobility between sites situated in marginal areas characterized by unpredictable access to ground water. Change, displacement and mobility all thus appear to have played important roles in the dynamism, transformation and longevity of Indus settlement networks.

Petrie, Cameron [272] see Bates, Jennifer

Petrie, Jacob (Veterans Curation Program), Sarah Janesko (Veterans Curation Program), Jasmine Heckman (Veterans Curation Program) and Jessica Mundt (Veterans Curation Program)

[187]

Filling Gaps: The Legacy of Archaeological Archives

In this poster we examine how the archiving of documents at the Veterans Curation Program (VCP) related to legacy archaeology collections owned by the U.S. Army Corps of Engineers can fill in gaps that may have been left by incomplete analysis and reporting

or outdated methodology. Often the use of older archaeology collections can be at best intimidating and at worst impossible due to a lack of coherent organization of notes, forms, maps, and other materials. While the VCP approaches the rehabilitation of archaeological material as an act of preservation, preventing further loss of information, the rehabilitation methods employed for the associated documents help to also conserve the material. Not only are the documents preserved and digitized for future researchers to access, they are organized and categorized in a way that allows those collections to fill out a larger picture of an excavation or data recovery project. While methods and standards for conducting archaeology may change, if there is a well maintained archive associated with each excavation, archaeologists and historians of the future will be able to reverse engineer much of what was done and perhaps make new discoveries or reinterpret the materials to shed light on the past.

Pettigrew, Devin

[69]

Variation and Distribution in Basketmaker Atlatls: A Typological Analysis

In the North American Southwest, prehistoric atlatls have been recovered from dry conditions and are associated with pre-Puebloan Basketmaker culture. Basketmaker atlatls are characterized by a suite of traits that distinguish them from atlatls found elsewhere in the Americas. Yet notable variation also occurs in extant Basketmaker atlatls. Patterns of similarity are noticeable both between specimens found at the same site, and in atlatls found on either side of the Southwest. Other sites contain multiple types. This paper presents an analysis of thirty three Basketmaker atlatls to develop a typological scheme of eight distinguishable types. Variability in Basketmaker atlatls supports ethnic diversity, temporal change, and mobility of populations within and outside of the prehistoric Southwest during pre-Pueblo times.

[69]

Chair

Peuramaki-Brown, Meaghan [178] see Longstaffe, Matthew

Pevny, Charlotte [17] see Smallwood, Ashley

Pfeiffer, Susan (University of Toronto), Judith Sealy (University of Cape Town), Lesley Harrington (University of Alberta), Tim Maggs (University of Cape Town) and Emma Loftus (University of Cambridge)

[240]

A Late Holocene Community Burial Area with Evidence of Violent Death: Table Bay, Western Cape, South Africa

Over several decades, human skeletal remains from at least twelve individuals were recovered from a small area (ca. 10 x 10 m) on the eastern shore of Table Bay, Cape Town, near the mouth of the Diep River. These skeletons of males, females, children and infants date to 2020–1580 calBP (nine radiocarbon dates). Dietary and behavioral evidence indicates a foraging lifeway. Unusually, several skeletons were interred with large numbers of ostrich eggshell (OES) beads; in some cases, careful excavation enabled recovery of segments of beadwork. Two groups were interred in shared graves. One collective burial held items including an ostrich egg-shell flask, a tortoise carapace bowl, a fragmentary bone point or linkshaft and various lithic artifacts. This group appears to have died together and been buried expediently. A mid-adult woman from this group sustained peri-mortem blunt-force trauma to her skull. This case adds to a developing picture of interpersonal violence among late Holocene foragers. All dates overlap but span several hundred years. The locale appears to have been used by a community as a burial ground, either regularly for several generations, or on a single catastrophic occasion, or some combination thereof.

Pfeiffer, Susan [171] see Hildebrand, Elisabeth

Phanomvan, Phacharaphorn (University of Oxford)

[48]

The Missing Big Picture: Settlement Size and Patterns in Western Mainland Southeast Asia during the First Millennium CE

How are cities distributed in Mainland Southeast Asia in the past? What were the estimated populations of these cities? Answering these questions leads to an understanding of the long-term urbanization trends and patterns, as well as the historical legacies associated with geographical effects on development. However, to date, there is no comprehensive record of spatially explicit, settlement-level population data at a regional scale. I develop a dataset of cities and settlements across Myanmar, Thailand, and Peninsular Malaysia in the first millennium CE by digitizing, transcribing, and geocoding archaeological records on settlements. This research refines Southeast Asian data presented in the global series on population estimates developed by Chandler and Modelski and addresses the data weakness mentioned by recent works from Reba, Reitma and Seto (2016). The dataset is the first to identify the macro-pattern of settlement distribution in Southeast Asia. It identifies three unique instances across time and multi-polar centers of agglomeration during the first millennium CE. Using the constructed dataset on settlement scale, I provide the first macro-population estimates for the region. This serves to help refine analysis on drivers of growth and constraints on regional agglomeration.

Phanomvan, Phacharaphorn (University of Oxford)

[110]

Moderator

[110]

Discussant

Phelps, Danielle (University of Arizona)**[263]***"Out of Sight, Out of Mind": The Atypical Inalienable Objects of Tutankhamun's Burial Assemblage*

Tutankhamun, one of the last kings of the Eighteenth Dynasty of ancient Egypt (circa 1330 BCE), was buried in one of the most intact royal tombs ever discovered in the Valley of the Kings. His burial assemblage is filled with many of the typical artifacts found in Egyptian mortuary practices. However, three groups are atypical: childhood mementos, heirloom, and artifacts with the names of Tutankhamun's immediate family members. The purpose behind their inclusion in the tomb is unknown. This presentation will examine the atypical artifacts through the utilization of statistical analyses, such as the Chi-Square, and the anthropological theories of memory works and secrecy to suggest that they are inalienable objects. They are a part of Tutankhamun's burial assemblage because of their connections to the tumultuous Amarna period. They were not destroyed because of their connection to the Amarna period but instead were deposited in Tutankhamun's tomb as a means to intentionally forget any association with Amarna or its religion.

Phelps, Danielle [252] see Mayfield, Tracie

Phillips, Bruce, Erik Steinbach (Logan Simpson Design Inc.), Travis Cureton (Logan Simpson Design Inc.) and Craig Fertlemes (Logan Simpson Design Inc.)**[79]***Evolving Hohokam Irrigation Strategies at La Plaza: A Multidisciplinary Approach*

Hohokam irrigation canals were first excavated in the lower Salt River Valley in the early Pioneer Period (AD 1–700), possibly as early as AD 200 at Las Acequias in east Tempe. Substantial expansion of irrigation facilities occurred in the Sedentary Period (AD 900–1150) and continued into the Classic Period (AD 1150–1450). During this time, Canal Tempe was a large main canal serving the site of La Plaza. The canal primarily irrigated land on an ancient terrace overlooking the Holocene floodplain. In recent excavations on the Arizona State University campus, the main canal was expected but not found. Rather, two relatively large main/distribution canals were discovered on the lower floodplain. Multiple analyses were conducted and data synthesized, showing that the larger canal (Feature 9, late Preclassic to Early Classic periods) appeared to carry large amounts of water mostly during the springtime. In contrast, the final channel of the smaller canal (Feature 12, late Classic Period) may have carried water year-round. This finding suggests a major change in water intake and distribution strategy, from intermittent to sustained flow, late in the Hohokam occupation.

Phillips, Bruce [175] see Franklin, Jay

Phillips, Emily (Northern Kentucky University)**[255]***The Interpretation Neutral Approach in Lithic Analysis*

Even though lithic artifacts are arguably the most common human-produced objects in the archaeological record, methods for maximizing their interpretive potential, although hotly debated, remain dramatically underdetermined. One problem is the chronic practice of using interpretation-laden (I-L) units of analysis to describe and interpret lithic assemblage variability. In this presentation, I illustrate how the interpretation-neutral (I-N) approach, introduced by Sullivan and Rozen, enables the development of unbiased inferences about the behavioral sources of lithic assemblage variability. In updating and refining the I-N approach, I focus on surface archaeological data from three different site types in the Upper Basin region of northern Arizona—masonry structures, lithic scatters, and fire-cracked rock piles. Using I-N measures of artifact density,debitage-to-non-debitage ratios, biface-to-core ratios, and Maximum Flake Area, I show that lithic assemblages associated with these three site types are the byproducts of more diverse sets of technological activities than I-L models predict. This research demonstrates the advisability and practicality of using established systematic, interpretation-free methodologies to determine the extent to which patterns of lithic assemblage variability are attributable to broader patterns of technological production and mobility.

Phillips, Erin (Coastal Environments Inc.)**[47]***Moundville's Hemphill Style Phases*

The Hemphill Style (AD 1325–1450) is Moundville's representational art style. Three styles phases (Early, Middle, and Late Hemphill) have been defined for this style. Though originally defined for engraved pottery, Hemphill-style objects in other genres can also be categorized into the three defined style phases. Other genres in the Hemphill Style include incised and painted pottery, shell and copper gorgets, stone pendants, and stone palettes. Shifts in the style through time may reflect changes in social identity at Moundville.

Phillips, Keenan**[234]***Landscape Domination and Social Stratification at Vulci*

Vulci was an Etrusco-Roman city on the eastern coast of Italy. As an epicenter of trade, the port played a significant role in the establishment of the Etruscan League. Excavations on the plateau and surrounding areas began in the nineteenth century, and the discoveries of some of the more famous tombs occurred as part of the Grand Tour during this period. Many of these excavations focused on the necropolis. A number of the tombs surrounding the ancient plateau are cut chamber tombs. However, there are three tumuli in the surrounding area. The Cucamella is the largest tumulus in all of Etruria and is situated to the east of the plateau across the Fiora river. It has been excavated at various times starting with Lucien Bonaparte in the early nineteenth century. This paper discusses how the use of landscape archaeology through viewshed analysis shows that the tumuli would have been visible from all

parts of the plateau of Vulci. The view of the tomb was a way of securing memory of the individual through domination of the landscape and could have acted as part of the process for developing social stratification that began to appear during the Orientalizing period at Vulci.

Phillips, Lori (Washington State University), Erin Thornton (Washington State University) and Eleanor Harrison-Buck (University of New Hampshire)

[14]

Ancient Maya Use of Fauna from the Wetlands and Beyond

Understanding how the ancient Maya interacted with wetland environments has been a topic of research for roughly 50 years. Previous studies suggest these resource rich environments provided a diverse assortment of flora and fauna for the ancient Maya to utilize. Wetlands provide an ideal environment for evaluating long held claims about the overall ancient Maya diet, which often emphasizes a reliance on large-bodied terrestrial mammals like white-tailed deer and peccary with less emphasis on smaller, wetland fidelic species. From 2015–2019, we investigated human-wetland interactions, targeting midden deposits from Maya archaeological sites within the lower Belize River watershed where some of the largest tracts of wetlands are found in Belize. We present zooarchaeological results from sites located proximate to these wetlands. Results suggest small-bodied aquatic animals, particularly turtles, were a key component of the overall diet compared to terrestrial mammals. These data are further corroborated by the presence of ceramic net weights recovered from these sites, which date to the Classic-Postclassic transition (ca. AD 800–1200). This study offers insight into site-specific climate histories through swamp-fidelic fauna, which was still widely available in the wetlands of Belize despite long-term drought conditions that characterize the climate histories across much of the Maya Lowlands.

Phillips, Natasha (Center for Archaeological Science, University of Wollongong), Zenobia Jacobs (Center for Archaeological Science & ARC Centre of), Brain Jones (School of Earth, Atmospheric and Life Sciences) and Alex Mackay (Center for Archaeological Science, School of Earth)

[11]

Gaining Contextual Control: Incorporating a Geoarchaeological Approach into South African Late Pleistocene Landscape Research

South African open-air archaeology is growing in recognition as a valuable source of Late Pleistocene information on human-environment interactions. More studies are pursuing a landscape-scaled approach that seeks to move beyond the rock shelter-dependant perspective. However, few open-air studies are dedicated to investigating the depositional and erosional phenomena involved in landscape formation, despite their known influence on the spatio-temporal distribution, visibility, and movement of discarded surface artifacts. This study involved a geoarchaeological investigation of a high-visibility, high-density archaeological surface in the semi-arid Doring River valley, an interior landscape located in the Eastern Cederberg of South Africa. The typotechnological composition, spatial distribution, and temporal signal of surface artifacts were investigated in relation to the sedimentological, geomorphological, and chronometric composition of underlying deposits. Results show that the spatio-temporal distribution of exposed artifacts is primarily a function of a landscape's depositional history, geomorphology, and sedimentological composition. Moreover, Holocene aridification coupled with historic farming practices have exposed older deposits, increasing artifact visibility and erosion. By employing a geoarchaeological approach this study demonstrates the coevolution of archaeological and landscape formation, emphasising the need for the incorporation of both into Late Pleistocene open-air studies to improve landscape-scale inferences made between open-air and rock shelter contexts.

Phipps, Raymond [259] see Bridgman Sweeney, Kara

Phon, Kaseka [28] see Hendrickson, Mitch

Pierce, Daniel [39] see Breault, Sarah

Pierce, Daniel [39] see Crawford, Dawn

Pierce, Daniel [150] see Crider, Destiny

Pierson, Arielle [254] see Kassabaum, Megan

Piezonka, Henny (Christian Albrechts University Kiel, Germany), Birte Ahrens (Deutsche Sporthochschule Köln, Germany), Sampildonov Chuluun (Mongolian Academy of Sciences), Martin Oczipka (University of Applied Sciences Dresden, Germany) and Jonathan Ethier (Christian Albrechts University Kiel, Germany)

[62]

Abandoned Cities in the Steppe: Roles and Perception of Early Modern Religious and Military Centers in Nomadic Mongolia

Towns and cities have been an integral part of the Mongolian nomadic society for more than a millennium, and abandoned urban sites from various periods dot the land, inscribing memories of lost empires and long-gone alliances into the cultural landscape. The relation between sedentary urban and mobile pastoralist life ways has constituted a key cultural, economic and political factor in one of the major pastoralist formations in Eurasia. The era in which most modern Mongolian cities are rooted is the period of Manchu rule in the seventeenth to early twentieth centuries. Subsequent political developments led to the abandonment or forced destruction of many of these urban focal points. Our project will study lost cities of this influential period of Mongolian history to solve the conundrum behind the sociocultural, economic and political dynamism associated with these religious and military urban centers. In an innovative interdisciplinary approach, the study combines archaeological, historical and ethnographic methods to trace the entanglement of former significance, historical perception and current roles and interpretations of abandoned Manchu period urban settlements.

Pike, Jean (ARC)**[197]***The Thingness of Networks: The Architecture of Integration in Classic Period Pueblos the Galisteo Basin*

It has been argued that, prior to European contact, the eight large Classic period pueblos of the Galisteo Basin—which share a watershed and could each be accessed by another in less than half a day's walk—developed a political organization that resembled a confederacy (Haas, 1997). Site layout has been identified as a means to access inferences about social organization (Cordell, 1996) and kinship practices (Ware, 2018) and recent research proposes integrative economies in the Northern Rio Grande, neighboring the Galisteo Basin, that were afforded in part by architecture and settlement strategies (Ortman, 2019). The research presented here asks whether architectural evidence supporting an integrative organizational model existed in the Galisteo Basin. Analysis of room block orientation accessed from lidar data that was correlated with early twentieth century maps prepared by Nels Nelson for the American Museum of Natural History form the basis of the research—direction being seen as key components of a connective Puebloan world view. How evidence from this research corresponds with architectural strategies employed by builders at Chaco Canyon is considered. Do these strategies represent an attempt to reinstate a not well understood Chaco-like system or, alternatively, to innovate a new mechanism of social integration (Cordell, 1996)?

Pike, Sabrina (Hamilton College), Nathan Goodale (Hamilton College), Alissa Nauman (Hamilton College), Colin Quinn (Hamilton College) and Anna Prentiss (University of Montana)**[5]***Procurement and Human Utilization of Fine-Grain Volcanic Rocks in the Interior Pacific Northwest: Case Studies of Arrowstone Hills Source Material Use at the Slocan Narrows and Bridge River Sites*

Sourcing lithic raw materials allows archaeologists to better understand the organization of stone tool procurement, human mobility, and trade and exchange. This poster presents the results of analyses of the chemical composition of lithic artifacts from two villages in interior British Columbia—Slocan Narrows and Bridge River. Communities at these sites used raw materials including fine-grain volcanic rocks originating from the Arrowstone Hills Volcanic Complex. This high quality dacite material was optimal for use because it is resistant, sharp, and durable. Using pXRF, we document the distribution of Arrowstone Hills raw material across the region from Bridge River to Slocan Narrows. The results allow us to explore different procurement models and how people obtained and distributed this raw material across the Interior Pacific Northwest.

Pilaar Birch, Suzanne [27] see Hadden, Carla

Pilles, Peter**[92]***Discussant*

Pineda, Daniel [121] see Alvarado, Jazmin

Pineda de Carias, Maria-Cristina (National Autonomous University of Honduras), Vito Véliz (Instituto de Arqueoastronomía y Patrimonio Cultural) and Ricardo Agurcia Fasquelle (Instituto de Arqueoastronomía y Patrimonio Cultural)**[130]***Estelas y calendarios de la Plaza del Sol de Copán, Honduras*

Presentamos un estudio arqueoastronómico del patrón de distribución espaciotemporal de las Estelas C, F, 4, H, A y B que Waxaklaju'n U B'aah K'awiil colocó en la Plaza del Sol de Copán, Honduras, entre 9.14.0.0.0 y 9.15.0.0.0. Para este trabajo realizamos observaciones astronómicas en la Plaza del Sol entre 2000 y 2010; y un análisis cronológico, secuencial e integral de la ubicación, orientación y distribución de cada estela interpretando posibles técnicas de observación astronómica que se utilizaron para seleccionar su número, lugar y disposición del arreglo. Encontramos que, para celebrar las principales divisiones del catorce k'atun e inicio del siguiente coincidente con un nuevo Tzolkin, se siguió un programa de celebraciones conjuntas de la Cuenta Larga y la Rueda Calendárica. Encontramos también que, la localización y distribución de las estelas revela la existencia de dos calendarios solares horizontales, uno de salidas y otro de puestas, en los que cada estela es un marcador direccional que señala eventos importantes del año solar, lo que interpretamos pudo ser el propósito de la conformación del arreglo. La iconografía de las Estelas H y A fortalece nuestra interpretación de que el arreglo responde a un patrón de señalamiento permanente del haab y el Tzolkin.

Pink, Christine [169] see Kolb, Michael

Piño, Mariela [224] see Murphy, Beau

Pinta, Elie (Université Paris 1 Panthéon-Sorbonne / UMR 8096)**[50]***Woodworking Strategies in Norse Greenland: Resources, Production, and Trade Patterns*

Used in construction and boat building, for domestic productions or as a fuel resource, wood was a key material for medieval North European societies. Several studies have been conducted on the topic of wood use in Scandinavia, the British Isles and the North Atlantic islands, and all demonstrate the wide variety of objects that can be unearthed when preservation conditions are good. The

goal of this paper is to present recent research carried on wooden artifacts used by the Norse Greenland inhabitants in order to better understand and retrace the origin and circulation of wood resources in the Norse Greenlandic society, located in an area of climatic margins, at the border of the Scandinavian world. I will also focus on the social lives of the wooden artifacts, looking into the "chaîne opératoire"—how were they made and what were they used for. What was the nature of the Norse Greenlandic society woodworking strategies and management and should it be understood in terms of cultural dynamics or adaptive strategies when compared to other case studies from the Norse world?

[50]

Chair

Pintar, Elizabeth (Austin Comm. College) and Maria Fernanda Rodriguez (CONICET-Instituto Nacional de Antropología y Pensamiento)

[125]

Plant Dependency and Risk Management Strategies in the Andean Puna

The archaeology of the Puna, a high elevation desert in South America, gives us a long-term perspective on the role of plants during the last 10,000 years. Through the study of macrobotanical remains we explore the impact of aridification on the use of edible plants in the diet of desert people. Our goal is to ascertain the variation/change in plant dependency over time, in particular in the light of drought conditions around 6000–3000 BP that characterized the Middle Holocene. Ethnographic projections appear to suggest a higher dependency on gathering than on hunting for most of this period; however, the macrobotanical record of edible wild plants seems to indicate the opposite. By contrast, the reliance on domesticated plants during the last 2,000 years, which was a period of lesser aridity, suggests the introduction of edible plants from other ecological areas—such as corn—and other plants—like quinoa—that may have been grown locally. This would have been accompanied by an increase in social interaction with areas lying beyond the boundaries of the Puna as a means of providing food security to populations whose subsistence depended mainly on camelid pastoralism.

Pinto Lima, Helena (Museu Paraense Emílio Goeldi, Brazil)

[161]

OCA—Culture, Origins, and Environment: Archaeological Collaborative Research in the Lower Xingu

The project investigates the historical ecology of a poorly studied area: the confluence of the Xingu and Amazon Rivers, in the lower Amazon region. By investigating distinct lines of archaeological evidence on a regional scale, it addresses, as an underlying research theme, the relationships among environmental factors, material culture, and human groups. From a diachronic perspective, it highlights the forms of human-environment interaction with particular interest in understanding the processes of formation and use of the anthropogenic soils; the creation of cultural forests; and the stylistic interactions of material culture. The project is based at the Goeldi Museum in Belém/Para/Brazil and involves several archaeologists, anthropologists, historians, biologists, geographers and several students. We will present results from field and labwork done since 2014, including the regional chronology, questions of territoriality, use of space and landscaping, both in the precolumbian indigenous past, interactions resulting from the complex colonial history of this region as well as some aspects of today's ribeirinhos culture. It is developed in full collaboration with the inhabitants of Gurupá, making the knowledge construction a shared experience.

[161]

Chair

Pinto Lima, Helena [161] see Wright, David

Pinto Lima, Helena [161] see Wyatt, Andrew

Pitblado, Bonnie (University of Oklahoma)

[31]

Discussant

Pitblado, Bonnie (University of Oklahoma)

[43]

Moderator

Pitblado, Bonnie (University of Oklahoma)

[88]

Discussant

Plank, Shannon (University of Kentucky), Scott Hutson (University of Kentucky), Barry Kidder (University of Kentucky) and Iliana Ancona Aragón (Universidad Autónoma de Yucatán)

[128]

Protoclassic Household Growth and Community Transformation in Yucatán

Recent excavations in northwestern Yucatán, Mexico, have recovered settlement pattern, architectural, ceramic, and artifactual evidence that documents Protoclassic political and economic transformations mirroring those noted in the southern lowlands during the Preclassic to Classic transition. During this period, the city of Izamal became the capital of a polity that encompassed an area of about 6,000 km², which itself exhibited considerable local complexity. The present paper examines Protoclassic household dynamics at Uci and Ucanha, two key sites in the ambit of Izamal that constitute, at the same time, a sacbe-linked micro-polity of their own. Our data show that the Late Preclassic was a time of remarkable demographic growth at both sites, and that household inequality increased during this critical time period. Several lines of evidence also suggest competition between emerging factions,

which transpired in domestic contexts and took a variety of forms, including feasts and innovative political pageantry. This competition may have had the unintended consequence of partial settlement abandonment. The paper compares these findings to patterns that are emerging from household archaeology in the Southern Maya Lowlands.

Plattner, Paige (University of Montana), Meradeth Snow (University of Montana), Aleksandar Kostic (Harvard University) and Marsha Wibowo (Harvard University)

[173]

Diet-Breadth Analysis in the Southwest: Comparison of Metabarcoding and Shotgun Sequencing Methods with Coprolites

The ability to capture diet-breadth from the archaeological record can be potentially biased due to lack of preservation. Several new techniques have been developed to study this further through genomic coprolite analysis. Samples from sites across the Southwest have been analyzed with two different techniques in order to aid in establishing a better baseline for the pros and cons for archaeologists looking to study past diets. This research quantifies and compares the results of the economical metabarcoding (PCR-based NGS sequencing) and deep HiSeq shotgun sequencing methods for future collaborating archaeologists and molecular anthropologists. Maize was a dietary staple in the Southwest, but the full breadth and extent to which the population was dependent on crop yield is unclear across time and space. The sites selected for analysis on coprolites from dry caves allow for a cross-cut of time and region in order to better estimate the timing and extent of the introduction of maize, and other components to the diet in the Basketmaker/Pueblo periods. The use of aDNA techniques provides a pathway to study and potentially quantify the breadth of flora and fauna consumed by the past inhabitants of the Southwest.

Platz, Lorelei [157] see Dennett, Carrie

Plekhev, Daniel (Brown University) and Parker VanValkenburgh (Brown University)

[242]

Defining Form and Function of Agricultural Terraces in the Middle Utcubamba River Basin, Chachapoyas, Peru

From as early as the Early Intermediate Period (~200 BCE) to the modern day, agricultural terraces have been constructed throughout the Andes for the cultivation of a wide assortment of crops and have served distinct environmental and ecological functions. Despite the longevity and variability of Andean terracing, the majority of archaeological research on these agricultural systems has focused on southern Peru, particularly on stone-faced bench terraces dating to the Inca period (fifteenth–sixteenth centuries CE). While these kinds of terraces are widespread throughout the Andes, they differ markedly from the agricultural terraces found in Chachapoyas on the northeastern slopes of the Andes. There, many terrace systems are earthen, ridge-and-furrow, and lack subdivisions or associated irrigation systems. This paper reports on three years of archaeological excavation, survey, and remote sensing aimed at mapping and studying these terrace systems throughout the Middle Utcubamba River Basin. We examine the placement of these terrace systems relative to factors such as solar insolation, soil temperature, wind patterns, hydrology, slope, and altitude to investigate their agricultural and ecological functions and how these vary throughout the region. Our results highlight the variability of terrace systems and call for a more comparative and diverse study of Andean terracing.

Plets, Gertjan (Utrecht University)

[221]

The Hidden Impact of Everyday Routines: How Do “Mundane” Digital Infrastructures Shape Archaeological Subjectivities and National Identities

The politicization of the past is often associated with the operationalization of captivating myths rooting the nation to its ancestral homelands. Although it is true that both authoritarian and democratic governments promote their agendas through strong statements in the media, or by appropriating archaeological sites and artifacts as part of their nationalistic portfolio, at the same time seemingly invisible bureaucratic procedures and practices are also entangling archaeologists with the identity policies of the nation state. This paper will specifically study how digital e-governance platforms administering excavation permits, on-line archives, and digital research infrastructures (national archaeological databases) can encourage archaeologists and historians to think in specific national terms or accommodate specific understandings of archaeology. We will base our analysis into the sociality of digital knowledge infrastructures on findings from Flanders (Belgium). Using a combination of methodologies from ethnography and digital humanities we have studied how digital infrastructures maintained by the national Flemish cultural heritage institution has changed the dispositions of practitioners on the ground and encouraged them to think in Flemish terms about the archaeological past. A comparison with Europeana, a European digital heritage platform will be made to explore the the politics and ethics of digital heritage.

Plevniak, Kelly (University of Minnesota)

[120]

Temperature and Temper: Analysis of Organic and Inorganic Tempered Clay through FTIR

Ceramics play an important role in pyrotechnological industries, such as metallurgy, and often they are the only evidence we find of a production site. Given the complexity associated with smelting and casting metal, the tools used for this process i.e., furnaces and crucibles, which are made of ceramics, have certain performance requirements in order to operate effectively. This experiment focuses on one such performance requirement, thermal shock resistance, but more specifically in context of early Anglo-Saxon metallurgy. This experiment does this by looking at the effect specific inclusions (chaff and sandy quartz) have on enhancing the durability of ceramics that were fired at different temperatures and tempered in varying percentages. Clay tiles were created and fired, the heated tiles were quenched in room temperature water, and visual changes, as well as the porosity of the tiles, were recorded. Porosity appeared to be affected by temper and percentage in small amounts. Visual evidence such as cracks and fractures were not as easily patterned. The tiles will be ground and prepared into small pellets for FTIR (Fourier-Transform Infrared)

spectroscopy. The results will be compared with special attention paid to the quartz peak across temperatures and tempers in order to gauge vitrification.

Plog, Stephen (University of Virginia)

[98]

Discussant

Pluckhahn, Thomas (University South Florida)

[135]

Discussant

Pluckhahn, Thomas [29] see Wallis, Neill

Plumlee, R. Scott (Gila River Indian Community, Cultural Resource Management Program), Kyle Woodson (Gila River Indian Community, Cultural Resource Ma), Craig Fertelmes (Gila River Indian Community), Chris Loendorf (Logan Simpson) and Steven Forman (Baylor University)

[229]

Mind the Gap: Absolute Dating of Middle Gila River Canals provides Evidence for 1,500 Years of Continuous Irrigation Agriculture in the Phoenix Basin

Evidence suggests that the first irrigation canals along the Middle Gila River were built by at least the Vahki phase ca. AD 450, and the construction and use of canals continued throughout the remainder of prehistory. Canal systems are also a prominent part of the historical lifeway of the Akimel O'Odham who live in the Hohokam core area today, with reported examples from at least the eighteenth century through today. Until recently, most researchers have assumed a gap existed between the presumed end of canal construction around AD 1450, and the canals that were historically documented in the early 1700s. However, recent Optically Stimulated Luminescence dating of canal deposits within the Gila River Indian Community include dates that bridge the assumed gap between the archaeologically documented prehistoric canals and the historically reported canal systems. The continuity of dating suggests that the various iterations of these systems have been in continuous use for at least 1,500 years. This possibility is supported by additional lines of evidence including O'Odham traditional knowledge and continuity in material culture along the Middle Gila River.

Plunket Nagoda, Patricia [119] see Torres Porras, Alicia

Pobiner, Briana (NMNH, Smithsonian), Laurence Dumouchel (Indiana University) and Jennifer Parkinson (University of San Diego)

[27]

A New Semi-Quantitative Method for Identifying Carnivore-Specific Bone Damage Patterns

Hypotheses of hominin scavenging from different felid species have been proposed, but the ability to distinguish between the taphonomic patterns inflicted by different felid species in the fossil record is currently underdeveloped. Previous efforts to identify taxon-specific taphonomic patterns inflicted by felids, which have largely focused on tooth marks, have not yielded promising results. As a Dienne Kenyon Memorial Fellowship recipient in 2000, Briana Pobiner's research project was focused on identifying carnivore taxon-specific bone damage patterns. Here, Pobiner and two co-authors build on her earlier work by presenting a new low-cost, low-tech, semi-quantitative method for coding carnivore-inflicted gross bone damage patterns, including a visual guide to different levels of bone damage inflicted on different skeletal elements and portions. A blind test of this method by three experienced taphonomic analysts indicates that this method is easy to use and results in consistent data across analysts. We also apply this method to quantify the intensity of damage that free-ranging African lions inflicted on zebra bones as a first step in identifying felid-specific taphonomic signatures.

Pobiner, Briana [76] see Peters, Kara

Poister, Nicholas (National Park Service) and Laura Baumann (National Park Service)

[137]

Bighorn Sheep (Ovis canadensis) Bone Caches in the Lava Tube Caves of El Malpais National Monument, New Mexico

The rugged volcanic landscapes of El Malpais National Monument contain over 400 lava tube caves, some of which harbor the most southerly perennial ice in North America. Many of the caves also house the material record of precontact human use in the form of internal architecture and ceramic and other artifacts. Caches of bighorn sheep (*Ovis canadensis*) bones, a species now extirpated from the area, are a reoccurring feature. Some of the caches are deposited in the deepest and most inaccessible chambers of the caves. Early twentieth-century ethnographies note a Puebloan prohibition against damaging the bones of game animals during butchery and cooking as these were designated to be placed on a special shrine. Among the Zuni, this shrine was located within a cave. The El Malpais bone caches may represent evidence of this ritual practice in antiquity. This would link the remains with a wider ceremonial pattern documented throughout Mesoamerica and still performed today as far south as the Guatemalan highlands. Alternatively, recent Park Service consultation with neighboring Pueblos suggests that ice caves formerly had a pragmatic function: the cold storage of meat. Zooarchaeological and spatial analyses shed light on the relative merits of these two explanations.

Pollack, David (Kentucky Archaeological Survey) and A. Gwynn Henderson (Kentucky Archaeological Survey)**[190]***Win-Win: Volunteers and the Kentucky Archaeological Survey*

Since the early 1970s, Kentucky archaeologists have actively engaged the general public, avocational archaeologists, and collectors in archaeological research. Through this interaction, numerous unknown and undocumented sites have been recorded, and looting activity has been reported at sites like Slack Farm in Union County. Avocational archaeologists have made significant contributions to our understanding of Kentucky's past by preparing site reports and by publishing journal articles and books, like *Rock Art of Kentucky*, alone or with professionals. Since its founding more than 25 years ago, the Kentucky Archaeological Survey has continued this tradition. The Survey counts volunteers and volunteerism as a significant element of its mission of research, education, and service. Volunteers come in many forms and from many walks of life. They volunteer for a host a very personal reasons. This paper considers the role volunteers have played and continue to play in the success the Kentucky Archaeological Survey has had in meeting its mission. Archaeology for and by the public is perhaps American archaeology's greatest contribution to our nation's cultural heritage.

Pollack, David [129] see Manzano, Bruce

Polo y La Borda, Martin [242] see Baitzel, Sarah

Pompeani, Katherine (University of Pittsburgh)**[35]***Using Multiscalar Patterning to Identify Social Relationships in a Large Bronze Age Cemetery*

Geographic Information System (GIS) technology is an important tool for examining social relationships in large horizontally stratified cemeteries. This study applies GIS-based cluster analysis to identify multiscalar patterning at the Early Bronze Age Maros cemetery at Ostojićevo, Serbia. Three successive scalar clusters were identified: (1) primary clusters; (2) secondary clusters within primary clusters; and (3) peripheral burials. Graves to the south exhibited a linear distribution along a south-north axis whereas graves to the north followed a circular clustering pattern. The potential social significance of these statistically derived clusters was assessed using demographic (e.g., age-at-death, sex) and mortuary (e.g., treatment, offerings) data. While there is limited evidence of spatial patterning among mortuary variables, near analysis of mean grave distance shows differences among age-at-death and sex cohorts. Notably, subadults (<15 years-at-death) were buried significantly closer to both subadults ($F = 44.78$, $p < 0.001$) and adult females ($F = 11.02$, $p < 0.001$). These observations tentatively support a pattern of close-kin clustering, specifically sibling groups or mother-child pairs. At the level of the cemetery, primary clusters likely reflect extended kin networks or lineages crosscut by social factors (e.g., gender, status).

Pomstra, Diederik [199] see van Gijn, Annelou

Ponce, Jocelyne (Tulane University), David Chatelain (Tulane University) and Marcello Canuto (Tulane University)**[130]***Ancient Maya Rural Lifeways and Regional Integration at La Corona, Guatemala*

Ancient Maya rurality has been typically defined on the basis of sparse settlement density in relation to adjacent denser urban centers. This fails to define the characteristics of rurality as a lifeway and the means by which regional landscapes were articulated. In this paper we discuss data from the rural settlement cluster of El Jobillo and the ceremonial center of La Cariba to define the practices that characterized rurality in the region of La Corona in northwest Petén during the Early and Late Classic. We argue that there were differences in practices and access to resources in 'rural' locations in comparison to denser 'urban' zones in the sparsely populated region of La Corona. Additionally, we discuss the economic, ritual and social practices that articulated populations across the landscape throughout the Classic period.

Pool, Christopher (University of Kentucky) and Michael Loughlin (Cardno)**[102]***Reconstructing Population Histories in the Gulf Lowlands: Review and Prospect*

Over the past three decades the Gulf Lowlands of Mexico have witnessed an explosion of systematically collected archaeological survey data. The Gulf Lowlands, however, present particular challenges for the collection of data, reconstruction of local population histories, and comparison among datasets within and beyond the region. These include (1) a dynamic geomorphology of meandering rivers with deep alluvial valleys interrupted by a historically active volcanic range with variable depths and distributions of ashfall strongly affect the preservation and surface visibility of archaeological features; (2) variable groundcover, including large areas of sugarcane production with low, dense, foliage that seasonally can frustrate lidar detection as well as surface visibility; (3) varying pedestrian survey and collection strategies; (4) an archaeological record containing accretional residential platforms large enough to have supported multiple residences and documented areas of non-mounded occupation; and (5) application of widely divergent assumptions in estimating and comparing population sizes. In this paper we critically review approaches to collecting and interpreting population history data in the southern and south-central Gulf lowlands, compare pedestrian and lidar-aided survey data recently collected in the Eastern Lower Papaloapan Basin and suggest ways to reconcile and compare population histories derived from diverse datasets.

Pool, Christopher (University of Kentucky)**[126]***Discussant*

Pool, Kelly (Metcalf Archaeological Consultants Inc.)**[56]***Elizabeth Ann Morris: From Dishwasher to Digger to Professor*

Liz Morris (1932–2012) grew up surrounded by artifacts and archaeologists as the daughter of Earl and Ann Axtell Morris, renowned Southwestern and Mesoamerican archaeologists. She launched her own archaeological career in 1951 when she attended field camp at Pine Lawn, NM, where dishwashing and cataloging were her main duties. Following a University of Arizona MA (1957) and four summers at Point of Pines field school, where she served as the only female dig foreman, she became U of A's first female anthropology PhD (1959). She discovered a love of teaching and, in 1970, became Colorado State University's first female archaeologist. Liz ran CSU's field school for 15 years, conducted pioneering research, and trained now-influential archaeologists until her retirement in 1988 as a full professor. Her career demonstrates women's increased acceptance in the profession from the mid-twentieth century onward. Liz's "female firsts" mattered less to her, however, than her achievements as an archaeologist, educator, and mentor.

[56]*Chair*

Pool, Marilen [258] see Bisulca, Christina

Pope, Melody, April Sievert (Glenn A. Black Laboratory of Archaeology, Indiana) and Terry Harley-Wilson (Glenn A. Black Laboratory of Archaeology, Indiana)**[172]***Broken Links in the Chain of Custody*

Few things are more exasperating than not having a clear chain of custody for archaeological collections. Compliance with the Native American Graves Protection and Repatriation Act (NAGPRA) is not the only regulation or situation that requires establishing ownership and recognizing that just because you may be in possession of something, does not necessarily mean you own it. Think of the hours spent sorting out collections resulting from compliance archaeology, past and present, searching vainly in a field report for the wording that tells you the clear owner, or that spells out transfers to a curation facility. Likewise, many donated collections come without a deed of gift. We explore, from the perspective of curation and registration, the legal and ethical tangles faced by museum and curation staff when they attempt to repatriate, coalesce separated collections, affect transfers, accession, or de-accession materials.

Popovici, Catherine [109] see Granados, Rosario

Porcayo Michelini, Antonio [170] see Des Lauriers, Matthew

Porter, Keri (Mississippi State University), Kaelyn Olson (Mississippi State University) and Andrea Lopez (Mississippi State University)**[147]***Free Photogrammetry: The Accuracy and Applicability of Open-Source Software*

Photogrammetry is a technique that creates a 3D model from 2D images. Photogrammetry is currently being used in archaeology to create models of artifacts, structures, excavation profiles, and burials with almost unlimited applications. Although the use of proprietary software may be related to the general user-friendliness and accessibility, the cost can still be substantial and restrictive. The use of open-source photogrammetry software can make 3D imaging more available to students and researchers who struggle with funding. To examine the usefulness and accuracy of open-source software compared to proprietary software, models of a skull cast were made using Meshroom (open-source) and Agisoft Metashape (proprietary). These models were then compared using the open-source software, CloudCompare. Results indicate that although the proprietary software provides more customization, optimization, and support during modeling, the open-source software still provides high quality models. For example, models can be edited in Agisoft Metashape, but models made in Meshroom must be edited externally with an additional software. Application of this research can increase access to affordable photogrammetry software and 3D modeling. However, more resources are available for training in proprietary software. Future projects will focus on creating instructional texts and videos for open-source photogrammetry software.

Porter, Mark**[150]***Caching Aggrandizers: An Analysis of Preclassic Maya Caches at Cahal Pech*

The deposition of dedicatory and termination caches in architecture is of great antiquity in Mesoamerica, extending from Preclassic times into the Colonial period. Many Preclassic caches were placed in a manner that reflects the orientation of the cosmos. Researchers have argued that placing cosmologically arranged caches in relation to monumental architecture served to animate a building's life force, and also to bolster the power and prestige of aggrandizing individuals in early stratified communities. This poster examines similarities and differences in Preclassic caching and the relationship of caching to the development of inequality. Using recently excavated deposits from Cahal Pech, Belize, this research compares previously excavated dedicatory caches across the Maya lowlands to determine any statistically significant results to support the interpretation of dedicatory caches as forms of aggrandization.

Portman, Katherine, Sherri Middleton (Tierra Right of Way Services), Galen McCloskey (Tierra Right of Way Services) and Sarah Page (Bureau of Land Management)

[148]

Predicting Site Distribution on the Arizona Strip

The region known as the Arizona Strip lies between Utah's southern border and the Grand Canyon. Although it was inhabited for millennia, the pre-contact culture history of the Arizona Strip remains relatively enigmatic compared to other areas of the American Southwest. During the 2019 field season, a team of cultural resources specialists from Tierra Right of Way Services performed two Class III survey projects in the region on behalf of the Bureau of Land Management (BLM). The survey covered over 8,000 acres of BLM land and included hundreds of previously unrecorded sites in two areas: one north of Grand Canyon-Parashant National Monument and one west of the Kaibab Plateau. Based on these site data, we performed a qualitative assessment of land-use patterns based on geology, soil type, slope, aspect, and proximity to potential water sources. We then created a predictive model to calculate the probability of an Archaic, Ancestral Pueblo, or historic site occurring in a given area. Actual site locations were compared to the model in both project areas to test its effectiveness. This model could drastically increase the efficiency of future data collection in the Arizona Strip and aid in understanding the motivating factors behind pre-contact settlement.

Porubcan, Paula (Illinois State Archaeological Survey), Paula Bryant (Illinois State Archaeological Survey), James Meierhoff (University of Illinois, Chicago) and Artur Stasiek (University of Glasgow)

[160]

Preservation on Public Lands: Chicago's CCC and WWII German POW Camps

Metropolitan Chicago contains 70,000 acres of public green space owned and managed by the Forest Preserve of Cook County (FPCC). This is the largest forest preserve district in the United States, with 40 million visits each year. Along with over 620 recorded archaeological sites, the Preserves also contain the remains of three Civilian Conservation Corps (CCC) camps, all of which were later repurposed as WWII German Prisoner-Of-War branch camps of Fort Sheridan. Camp Skokie Valley, in particular, was one of the largest CCC Camps in the United States, housing over 2,000 men. As publicly held resources, it is important that research and preservation efforts are guided by community interest and support. Community partners include FPCC resource managers, professional archaeologists, local residents, local historical societies, and graduate student researchers. This presentation will highlight the archaeological and architectural components of Camp Skokie Valley; results of archival research, fieldwork, and public engagement efforts accomplished thus far; and future plans for continuing research within the camps as well as collaboration with researchers working on similar sites and issues across the United States.

Porubcan, Paula [213] see Meierhoff, James

Postemski, Megan (University of Pennsylvania)

[213]

Improving Their Lot: Frontier Settlement and Landscape Change in Maine

Frontiers have traditionally been portrayed either as ripe for settlement and replete with resources, or as rugged and dangerous peripheries where pioneers struggled to adapt. Given factors ranging from harsh winters to warfare, the latter portrayal dominates narratives of America's Eastern Frontier during the eighteenth and nineteenth centuries. My work interrogates these notions of a largely intractable frontier environment by examining how and to what extent Euroamericans modified the Downeast Maine region through settlement and enclosure. Assessing enclosure—the continuous bounding and cultivation of the landscape—is especially important because it structured frontier life and because it manifests in physical landscape features (e.g., stone walls, fields). While today forests obscure traces of Maine's agrarian past, archival evidence helps reveal how patterns of settlement and enclosure became writ large on the landscape. Using historic tax valuation data from nine towns, I trace changes in the land by farmstead, regionally, and over time. The data indicate that enclosure proceeded unevenly across frontier towns, complicating negative portrayals of frontier life and highlighting how pioneer activities and decision-making became embedded in the landscape.

Posth, Cosimo [244] see Ferraz da Silva, Tiago

Pott, Laura (University of Oklahoma), Rita Austin (University of Oklahoma), Andrea Eller (Department of Biological Anthropology, National Mu) and Sabrina Sholts (Department of Biological Anthropology, National Mu)

[242]

Population-Level Assessment of Cranial Modification and Atlanto-Occipital Fusion across Nine Regions of Peru (1300–1500 CE)

This study examines the distribution of atlanto-occipital fusion (AOF), a rare spinal anomaly, across nine regions of prehispanic Peru in order to investigate the relationship between cranial modification and presence/completeness of AOF. Cranial modification involves the use of wraps or pads to mold infants' cranial bones into shapes that signal social identity. Cranial modification occurs alongside AOF in a sample of 1407 Peruvian individuals held at the National Museum of Natural History, are dated to 1300–1500 CE. AOF, the partial or complete fusion of the first cervical vertebra (atlas) and occipital bone, arises from congenital or environmental causes. For example, the restriction of movement associated with cranial modification may influence AOF by changing the way the atlas bears the skull's weight. AOF has been previously described in prehispanic Peru but has not been directly linked to cranial modification. AOF was observed in four coastal regions, two of them previously unreported, and it occurred at a significantly elevated rate in Ica. Chi-square analyses show there is not a significant correlation between cranial modification and presence/completeness of AOF. Genetic or environmental conditions along the coast may be further explored as factors shaping this geographical and population distribution of AOF across Peru.

Potter, Ben [82] see Gillispie, Thomas

Potter, Ben [82] see Reuther, Joshua

Potter, Bethany (University of Kansas), Caroline Kisielinski (University of Kansas), Justin Tackney (University of Kansas), Dennis O'Rourke (University of Kansas) and Frederic Sellet (University of Kansas)

[244]

Bloody Sharp Rocks: Optimization of aDNA Extraction from Experimental Lithic Artifacts

Species detection using DNA recovered from lithic artifacts could indicate the manner in which tools were utilized and ultimately enhance our understanding of the mobility strategies and subsistence patterns employed by past peoples. Geneticists and archaeologists in the 1980s and 1990s managed to successfully extract DNA from lithics, using both modern experimental tools and lithic artifacts from archaeological contexts. These methods have seen little revision, despite advancements in ancient DNA (aDNA) technologies over the past decade. Researchers can now successfully sequence aDNA from bone, wood, and sediment, and these same advancements might allow the recovery of aDNA from lithic artifacts. In this study we implement updated aDNA extraction methods on a set of modern stone tools, which we previously used to process lamb remains and subsequently buried, to identify methodological conditions for successful species detection.

Poulin, Mairead (University of Arizona)

[79]

Access, Visibility, and the Social Landscape: The Chevelon Steps Petroglyphs

Archaeological examinations of petroglyphs and pictographs primarily seek to interpret ancestral imagery using an iconographic lens. Considered far less frequently is the influence of environmental context and landscape placement on the meaning of these images. Given the strength of the ethnographically-documented relationships between the continent's ancestral Native populations and the landscapes they inhabited, this methodological gap is particularly noteworthy in the study of North American rock art. In an analysis of the Chevelon Steps in northeastern Arizona, I examine the distribution of the site's 3,000+ petroglyphs from an iconographic and geospatial perspective. Drawing from previous work on petroglyph viewership, I operationalize the intended scales of access and visibility for each petroglyph in terms of their placement within the site's landscape. I then compare iconographic and publicity trends across the site to determine which factors vary most significantly. Results of this analysis, in tandem with ancestral ontologies surrounding the site's environment, suggest the locational contexts of the petroglyphs may influence their roles in the site's social landscape more strongly than their iconographic designs. These findings articulate the need for an increased adoption of landscape archaeology methods in the interpretive study of North American rock art.

Powell, Allie (Indiana University-Purdue University Indianapolis) and Jeremy Wilson (Indiana University-Purdue University Indianapolis)

[167]

Children of the Gilded Age: Juvenile Age Estimation and Fertility Approximation for the Bethel Cemetery

Bioarchaeological analyses of the Bethel Cemetery have provided a unique opportunity to understand population dynamics in central Indiana during the nineteenth and early twentieth centuries. With over 40% of exhumed individuals classified as juveniles, the cemetery can be characterized as being derived from a once-living population with high fertility rates. However, making inferences about fertility and growth requires careful consideration of skeletal samples' inherent biases and potential methodological shortcomings. In particular, the methods selected to estimate age-at-death for juveniles can have significant impacts on subsequent proportional measures of fertility and childhood survivorship, resulting in disparate reconstructions of demographic patterns. Our study examines two widely utilized methods for estimating age-at-death via tooth crown and root development. We employ both methods and then compare how each affects the proportional measures used by archaeologists to estimate fertility and childhood survivorship. The dental age estimation methods resulted in two significantly different survivorship curves and had a variable impact on the proportional measures of fertility. Our results indicate that researchers need to be cognizant of the structure of their skeletal sample, make informed decisions regarding age estimation techniques, and consider the applicability of differing fertility estimation techniques when attempting to reconstruct past population dynamics.

Powell, Evelyn (Harvard University), Zachariah General (Chiefs of Ontario), Stephen Tsuji (University of Waterloo), Konstantin Latychev (Harvard University) and Leonard Tsuji (University of Toronto)

[252]

Akimiski Island, Nunavut, Canada: The Use of Cree Oral History and Sea-Level Retrodiction to Resolve Aboriginal Title

On April 1, 1999, Akimiski Island of the western James Bay region was included in the newly formed, Inuit-dominated territory of Nunavut, Canada. Only the Omushkegowuk Cree, however, have ever asserted Aboriginal title to Akimiski Island. By their action – or inaction – the Government of Canada has reversed the onus of responsibility for proof of Aboriginal title from the Inuit to the Cree. In this work, we documented and employed oral history to demonstrate that Cree traditional use and occupancy of Akimiski Island was “sufficient to be an established fact at the time of assertion of sovereignty by European nations” (INAC, 1993; p. 5; INAC, 2003; p. 8). In particular, we used state-of-the-art historical sea-level modeling to retrodict the timing of the emergence of Akimiski island, an emergence story prominent in Cree oral history. This work demonstrates that all criteria of the Canadian common law test for proof of Aboriginal title with respect to Akimiski Island are met. Thus, the Cree have sufficient basis to initiate the process of a formal land claim.

Powell, Evelyn [162] see Borreggine, Marisa

Powers, Michael [9] see Wholey, Heather

Powis, Terry (Kennesaw State University), Gary Owenby (Kennesaw State University) and Matthew Tarleton (Kennesaw State University)**[197]***Middle Preclassic Maya Public and Domestic Architecture at Pacbitun, Belize*

Investigations in Plazas A and B of the site core at Pacbitun indicate that initial occupation began in the early Middle Preclassic period (900–600 BC). At this time, a small agricultural community was established in Plaza B beginning with a few domestic structures built just above bedrock. These early domiciles would also function as workshops for the production of marine shell beads. During the late Middle Preclassic (600–300 BC), the size of the community in Plaza B expanded five-fold, with rectangular-shaped platforms replacing the early apsidal structures and the shell bead industry intensifying significantly. It is during this period that two large ceremonial platforms were erected at the site. While these buildings represent the first two monumental constructions at Pacbitun, their unique physical and spatial attributes say much about their distinct identities as they relate to each other and to the domestic structures of Plaza B. The purpose of this presentation is to detail these distinct identities and discuss what each might tell us about the residents living and working in Plaza B. Comparative data from other sites will be utilized to see how Pacbitun fits within the broader Mamom sphere sweeping across the lowlands.

[197]*Chair*

Powis, Terry [130] see Micheletti, George

Powis, Terry [197] see Skaggs, Sheldon

Pratt, Jordan (Texas A&M University)**[195]***Haskett and Crescents: A First Look at the Lithic Tool Analysis from Weed Lake Ditch, Oregon*

Several Paleoindian open-air sites with buried stemmed point technology have been discovered in the Harney Basin, southeastern Oregon. These sites provide a unique way to expand on our current understanding of Western Stemmed lithic technology and subsistence practices from the late Pleistocene and early Holocene. The research presented here focuses on new results from Weed Lake Ditch, a site located on the relict margins of pluvial Lake Malheur. Previous excavations at Weed Lake Ditch recovered seven Haskett-style stemmed points, six crescents, a bone needle, stone pendant, bone bead preform, and many non-diagnostic stone tools and faunal remains. This assemblage corresponds favorably with Younger Dryas-aged occupations throughout the northern Great Basin; unfortunately, no precise radiometric evidence has been obtained from the site and previously the association between the stemmed points and crescents was not well understood. Over the course of the 2019 field season, additional Haskett points were found in direct association with crescents, preforms, and another bone needle. This paper reviews the spatial distribution and analysis of stone tools recovered during the 2018 and 2019 field seasons in order to explore lithic technological organization at the site.

Pratt, Jordan [75] see Juptner, Derick

Pratt, Lauren and Anna Guengerich (Vanderbilt University)**[6]***Examining the Stone Tools of Late Prehistoric Chachapoyas, Peru, through Microscopic Use-Wear*

Compared to other material types such as ceramic, metals, and textiles, the lithics of later Peruvian prehistory remain poorly understood. This is in part because, outside of certain elite or ceremonial contexts, these assemblages tend to be relatively small and technologically informal. Here, we employ low-power microscopy (8–80 x magnification) to search for use-wear on the lithics of four ceramic period sites in the Amazonas Region of northern Peru. The relatively small size of the combined assemblages (n=354) allowed for microscopic examination of all lithic artifacts, including debitage. Use-wear was found on 25 artifacts from the sites of La Joya and Bóveda. The majority of these were debitage without macroscopic retouch, which otherwise would not have been identified as used tools. These results provide an additional line of evidence for subsistence activities at these sites, suggest that stone may have remained a useful material for everyday household tools throughout multiple period of later prehistory, and highlight the need for additional attention to and analysis of stone artifacts throughout all periods of Peruvian prehistory.

Pratt, William (University of Texas, Austin)**[201]***The Quilotoa Hypothesis: Post-disaster Cultural Change and Resilience among the Cara*

The Quilotoa eruption, with an estimated VEI of 6, was one of the most devastating eruptions in Ecuadorian prehistory, spreading ash over most of the country and producing broader global impacts that are still poorly understood. Quilotoa was one of several large eruptions that took place between about 1250 and 1300 AD ejecting vast quantities of aerosols into the atmosphere potentially kickstarting a polar ice buildup that led to the Little Ice Age. In the northern highlands of Ecuador, climatological data indicates that significant cooling and drying followed the eruption and the raised field system of agriculture practiced widely in the region was largely abandoned. It is from this context of disaster and changing climate that Cara culture flourished, building some of the most impressive architectural features in all of Ecuadorian prehistory and eventually developing a level of social complexity that allowed them to unite in resistance against the most powerful precolumbian empire for at least a decade. The Cara peoples' rapid transition from devastation to dominance after Quilotoa represents both significant adaptation and resilience. This paper explores the possible connections between the immediate and long-term effects of the Quilotoa eruption and the rise of the Cara.

Pratt, William [201] see Martal, Clementine

Prebble, Matthew [124] see Ladefoged, Thegn

Prendergast, Eric

[3]

Finding Fort Brooke's Other Cemetery, Tampa, FL

Before Tampa became a town, it was the site of an important U.S. Army installation on the coast of the sub-tropical frontier, in early nineteenth-century Florida. Founded in 1824, Fort Brooke played a central role in the settler-colonial conquest of American Florida, during the Jacksonian Age. At its height in the 1830s, over 4,000 U.S. troops lived there. But all traces of the fort, including two known cemeteries, were subsequently lost beneath the streets of growing Tampa, as the city expanded in the twentieth century. One of the fort's cemeteries was discovered in 1979, but the second cemetery remained lost for the next four decades, sealed somewhere beneath the hardtop and skyscrapers. This paper presents the discovery of Fort Brooke's second cemetery, the Estuary Cemetery. The paper addresses the archival research and mapping methods that were used to develop a predictive model, and the excavation techniques that were applied to test the model in the crowded urban environment. The paper describes drone photogrammetric modeling of the entire site, and an ongoing program of research designed to address this important archaeological resource.

Prendergast, Eric [193] see Moates, Jeffrey

Prentiss, Anna [5] see Pike, Sabrina

Preucel, Robert (Haffenreffer Museum, Brown University)

[112]

Discussant

Preucel, Robert [41] see Laluk, Nicholas

Prewitt, Elton

[16]

Painted Pebbles of Southwest Texas: Archaic Proto-Kachinas?

Painted pebbles found in the Lower Pecos River region of southwestern Texas and northern Mexico typically are viewed as objects used in curing, healing and, especially, female rituals. In broader terms they are associated with increase rituals similar to the functions of kachinas in the American Southwest. I explore the possibility that painted pebbles may represent an Archaic proto-kachina tradition.

Price, Douglas [173] see Nakatsuka, Nathan

Price, Kyra [221] see Bush, Dominic

Price, Neil (University of Uppsala)

[50]

Women . . . and Weapons? Debating Viking Age Gender in 2020

From September 2017 until today, discussion has continued around the reinterpretation of a Viking-Age chamber grave from the island settlement of Birka in Sweden, argued to be the burial of a female warrior (a project with which I am closely involved). For decades now, academics have recognised the problems, and potentials, of using mortuary behavior and the excavated, material evidence of funerary practice to reconstruct the living identities of the buried dead. In full awareness of this, archaeologists and other scholars often claim to seek a pluralistic view of the early medieval past, one that acknowledges diversity and rejects prejudice; this applies especially to the arena of gender, in its widest sense. But are they, are we, succeeding? This talk will briefly review the interpretation of the Birka burial Bj.581, but primarily aims to reflect on the wider state of gender studies relating to the Viking Age, as illuminated by the research team's experiences during the ensuing controversies.

Price, Seth [35] see Smith, Alexander

Prieto, Gabriel (University of Florida)

[174]

At the Dusk of Chavin: Social, Economic, Political, and Ideological Implications as Viewed from a Fishing Settlement in the North Coast of Peru

Recent progress in the refinement of absolute dates recovered at the ceremonial and pilgrimage center of Chavin de Huántar is helping to reconsider the regional effects of the Chavin Sphere of Interaction in the North Coast of Peru. This new data suggests that Chavin de Huántar was occupied for about 500/400 years. Although the nature of Chavin de Huántar is still elusive for the Moche Valley, thanks to recent excavations in Huanchaco it is possible to evaluate the social, economic, political and ideological post-effects left by the Chavin phenomenon in this north coast valley. Current excavations provided important domestic, ceremonial

and burial contexts associated with the post-Chavin occupation in the Huanchaco bay which is summarized here as: a) the size and complexity of the residential settlement; b) emergence of local elites; c) local ritual practices; d) long-trade exchange networks and e) subsistence patterns, as a proxy for the study of cultural change and as indicator of environmental challenges during that period.

Prieto, Gabriel [174] see Comeca Ramirez, Gianina

Prieto, Gabriel [174] see Rivera Prince, Jordi

Prignano, Luce [48] see Fulminante, Francesca

Primeau, Kristy (NYS DEC)

[25]

Current Trends in Archaeoacoustics

In recent years, archaeological research has trended toward the exploration of the experiences of past people, particularly through engagement with the senses, seeking new methodologies and associated theories to develop this understanding. Sounds and auditory experiences occurred ubiquitously throughout time and within all cultures. Current research approaches to archaeoacoustics, psychoacoustics, soundscapes, and archaeomusicology are as variable as the sonic hypotheses that can be explored. The importance of what was and wasn't heard in the past is approached through a variety of methods including: subject-centered-survey, on-site experimentation and recording, reproduction or playing of instruments, and computer aided modeling such as Virtual Reality or Geographic Information Systems approaches. Theoretical approaches such as affordance theory, performance theory and phenomenology situate our methods and task us to delve deeper, considering how auditory experiences conferred connotations of power or contributed to the formation of individual and group identities. This paper serves as an introduction to the papers being presented within the symposium "Archaeoacoustics: Sound, Hearing, and Experience in Archaeology," and presents a general overview of the field of archaeoacoustics by reviewing commonly employed methods and theories.

[25]

Chair

Primeau, Kristy [25] see Bement, Leland

Primeau, Kristy [25] see Richards-Rissetto, Heather

Prince-Buitenhuys, Julia (CA Dept of Water Resources)

[153]

Discussant

Priola, Victoria (University of Iowa), Margaret Beck (University of Iowa), Luis Benítez de Lugo (Universidad Autónoma de Madrid) and Katina Lillios (University of Iowa)

[35]

Vessel Form and Paste Recipe: Ceramics from Castillejo del Bonete, Spain (2465–1565 cal BCE)

Castillejo del Bonete is a monumental ceremonial site dated between 2465–1565 cal BCE (Copper and Early Bronze Age) in the La Mancha region of central Spain. Although sometimes associated with motillas, sites in the region with monumental wells built to access underground aquifers, contemporary with Castillejo del Bonete's Early Bronze Age use, this site is not a motilla as it does not have a well. The architecture of Castillejo del Bonete is unique, and the full range of activities that took place is unclear. The burials found at the site indicate that it served as a home for the dead, and the orientation of its monumental corridors aligned to the solstices suggest important ritual practices. However, a wide array of ceramics found at the site suggests additional activities may have also taken place. To better understand the nature of the site, characterizations of vessel forms and analyses of paste recipes for a sample of ceramics collected by surface survey were undertaken. Paste recipes and inclusions were studied for variations both within and between identified vessel forms. These variations will be used to explore functions, production methods, and possible source areas for the raw materials.

Pritchard, Erin [193] see Malo, Erika

Pritchard, Erin [60] see Simek, Jan

Prociuk, Nadya (University of Texas, Austin)

[108]

Silver against Skin: Exploring the Materiality of the Cividade de Bagunte Torques

Among the most dazzling traces of behavior left behind by the Castro people of the Cividade de Bagunte in northwestern Iberia are the five silver torques discovered together in a hoard in the mid-twentieth century. The items in the Bagunte hoard share stylistic similarities with other Castro torques, but their material, silver rather than gold, marks them as unique in the corpus of Castro ornaments. Torques manifested a complex network of behaviors and values for the Castro people, and in this paper I aim to untangle the dense significance of these items of personal adornment. I will discuss the Bagunte torques as the particular material manifestations of economic and social forces expressed with technological finesse. I will also explore the social and symbolic work enacted by these objects, including their potential roles in social negotiations, ritual performances, and the formation, maintenance, and negotiation of personal and corporate identity.

Proenza, Joaquín [246] see Weber, Marion

Proulx, Benoit (University of Sheffield), Michalis Gazis (Hellenic Ministry of Culture & Sports) and Peter Day (University of Sheffield)

[196]

Preservation and Adaptation: Potters and Pottery Traditions at Teichos Dymaion

The Late Bronze Age of the Central and Eastern Mediterranean shows rich evidence for contacts between different regions. A key element in understanding these mobilities is the appearance of handmade burnished pottery (HBW) in Mainland Greece, Crete and Cyprus in the late thirteenth century BCE, seemingly transplanted into areas using high quality wheelmade finewares. Debate has centered on whether HBW represents a mode of production reflecting social and economic collapse, the influx of foreign workers, or indeed a slave class. Here, HBW is approached by the concept of pottery traditions, to produce a localized understanding of pottery production, rooted in both technology and style. This facilitates the study of parallel ways of doing and explores their interaction, as potters engage in processes of adoption, adaptation, or rejection. This case study is based on the HBW from Teichos Dymaion, Greece, a major harbour offering the first landfall for maritime traffic from Italy, often cited as the origin of this type of pottery. Using thin section ceramic petrography to investigate diversity reveals how this seemingly foreign pottery evolved in the northwestern Peloponnese, and how potters adapted to their new environment, with the context of neighboring local pottery traditions.

Prout, Michael (CSULA)

[137]

Maya Sacrificial Practices in Caves: It Isn't Just Men Captured in Battle

There are two types of ancient Maya human sacrifice. The first is when people are sacrificed in association with important communal events including changes in political power, victories in battle, and the deaths of important community members. The victims of these types of sacrifice are most often viewed as men based on models developed in the late twentieth century. However, recent investigations of Maya caves have found much more evidence supporting the other type of sacrifice—offerings to the gods for favorable reciprocations, such as the end of a devastating drought or the improvement of the community's health. Studies at both the Osario Infantil and the Cenote Sagrado at Chichen Itza as well as Midnight Terror Cave in the Cayo District of Belize imply children were sacrificed to propitiate the gods in petitions for rain and this ritual was a regular occurrence. This paper will discuss the evidence found in caves for both models, particularly in regard to child sacrifice, and the implications of this evidence on the understanding of Maya ritualistic practices.

Prouty, Michael [147] see Johnen, Connor

Prufer, Keith [270] see Alsgaard, Asia

Prufer, Keith [7] see Lemly, Marina

Prufer, Keith [233] see Ray, Erin

Prufer, Keith [29] see Thompson, Amy

Psoma, Aikaterini (University of Illinois, Chicago) and Zarko Tankosic (Norwegian Institute at Athens)

[199]

Craft Production and Exchange in Prehistoric Greece: New Results from the Chipped Stone Assemblages of Southern Euboea of Southern Euboea

Recent archaeological projects provide new data on the prehistory of Southern Euboea in Greece, a key location that bridges the Aegean islands and the Greek mainland. During the transition from the Neolithic to the Bronze Age (late fifth-fourth millennium BCE) numerous transformations occurred across the region that altered settlement dynamics and resulted in a dramatic increase in the complexity of exchange networks and in specialized craft production. We discuss preliminary results from the technological and typological analyses of prehistoric lithics recovered by the Norwegian Archaeological Survey in Karystia (NASK) and the Gourimadi Archaeological Project (GAP) in Southern Euboea. The study of these lithic assemblages shows differential dynamics and centralization among prehistoric settlements, providing us with new clues regarding the use and procurement of lithics in the area. We will use these clues to determine the different types of production that took place at specific sites; to infer exchange and distribution mechanisms; and to understand the role of these prehistoric sites in the lithic exchange network of Southern Euboea and the southern Aegean Sea.

Puckett, Neil (Texas A&M CSFA)

[238]

The Walker Lake Landscape: Combining Geophysical Studies to Clarify Regional Change and the Archaeological Record

The high desert basin surrounding Walker Lake, NV, has been subject to multiple landscape shifts since the lake reached its Late Pleistocene highstand, 15,679 cal BP. Research has identified at least four lake transgression and regression events postdating 5000 BP, and after its nineteenth-century historic highstand, the lake has fallen roughly 50 m. These changes reveal a complex fluvial and lacustrine system that past human populations would have adjusted to and exploited in a variety of ways. At times people had the opportunity to make use of a large waterbody and swift river filled with cutthroat trout, while at others the local resources would have been limited by a shallow, saline lake fed by an intermittent stream. To better understand the variability of this landscape, this paper details new research identifying geophysical and geomorphic data found on the basin's terrestrial landforms as well as underneath the modern lake. This research helps reveal the basin's past landscapes. Combined with the presence of archaeological sites found across the Walker Lake basin, these data help to clarify past behavioral adaptations and suggest a strong

potential for site preservation below the lake's waters in buried, datable contexts.

Puente, Nicholas (Loyola University Chicago) and Philip Arnold (Loyola University of Chicago)

[150]

An Analysis of Inequality at Late Formative Households in Southern Veracruz, Mexico

This research poster presents an analysis of archaeological information from La Joya and Bezuapan, two late Formative Period (ca. 400 BC-AD 100) sites in southern Veracruz, Mexico. The study focuses on the ways in which wealth inequality is manifested in the archaeological record; wealth is defined here as the total of desirable factors including relational, embodied, and material that provide value. An analysis of systematic coring data in addition to information derived from in-field excavations provides insight into wealth inequality across households at the two sites. These data are interpreted using an economic measure known as the Gini index. The Gini index assesses the cumulative distribution of percentile values in reference to an assumed constant. This measure is increasingly applied to archaeological sites, and this poster seeks to provide another useful and comparable archaeology example of the Gini index's utility. This analysis will also provide additional information relevant to the study of Formative Period societies along the Mexican Gulf lowlands.

Puértolas, Carlos (UNAM.), Maria Vázquez-de-Ágredos-Pascual (Departament d'Història de l'Art, Universitat de València) and Linda Manzanilla (Instituto de Investigaciones Antropológicas)

[10]

La tecnología del color en Xalla: Instrumentos, materias primas y procesos de manufactura

El color es uno de los elementos característicos de Teotihuacan, tal y como refleja la rica policromía expresada en soportes como la arquitectura y su pintura mural o la cerámica estucada y pintada. Sin embargo, poco se conoce sobre cómo se elaboraba color en la ciudad Clásica del Centro de México (150/200 -650 dC). ¿Qué materias primas se utilizaban? ¿Cuáles eran las mezclas? ¿Cuáles eran las herramientas y pasos de su cadena operativa? Los diversos útiles de lítica pulida recuperados en Xalla han permitido conocer un poco más sobre diversos aspectos de la tecnología del color en la urbe mesoamericana. A partir de la combinación de arqueometría, arqueología e historia del arte, se ha logrado identificar los principales compuestos de la paleta pictórica de Xalla y se ha propuesto una cadena operativa para elaborar pigmentos dividida en cuatro pasos, desde el desbastado y limpieza de los minerales hasta el molido y mezcla de los diferentes compuestos que se utilizaron para embellecer las esculturas, los pisos y los muros de este complejo palaciego teotihuacano.

Punzo Díaz, José Luis (Instituto Nacional de Antropología e Historia), Jakob Sedig (Harvard University), Alejandro Valdes (Instituto Nacional de Antropología e Historia) and David Reich (Harvard University)

[173]

First Results of the "Proyecto de investigación de poblaciones antiguas en el norte y occidente de México"

Genomic analytical techniques have matured enough to be able to address long-standing archaeological questions about the interaction and migration of ancient populations that inhabited the North and West borders of Mesoamerica, as well as the American Southwest. With that in mind, we established a collaborative binational project between INAH and Harvard University. Our aim is to understand the degree of the phylogenetic relationship between the populations of the West and North of Mexico and American Southwest between the years 600–1500 CE. This paper provides initial results of the collaborative project between 20 archaeologists and Reich Laboratory geneticists. These results address how and when the populations of Western and Northern Mexico moved across the northern border of Mesoamerica. We assess the impacts of these population movement on ancient Mexican and the American Southwest groups. We also provide an overview of the project's research design and collaborative efforts between Mexican and American researchers.

Punzo Díaz, José Luis [198] see Martínez Vázquez, Dante Bernardo

Putnam, Shanda [240] see Blatt, Samantha

Pyburn, Karen Anne (Indiana University)

[226]

LARPing Archaeological Research Ethics

Real-world situations are too complex to debate as though there were only two opposing opinions on a research dilemma. To expose students to the complexity of decision-making, I incorporate live action role play (LARP) into my classroom. My purchase of a LARP online that concerned government infiltration of an activist group worked, but lacked direct applicability to archaeology. Next, I assigned a class to produce their own LARP based on a dissertation with serious ethical problems. The results of this experiment have implications for engaging a broader audience more deeply than assigning a typical suite of ethics-oriented texts.

Pye, Jeremy (Cultural Resource Analysts Inc.)

[240]

Modeling the State of Health: Building a Multidisciplinary Framework for Bioarchaeology

Scholars in various disciplines, including epidemiology, ecology, public health, anthropology, geography, and sociology, have attempted to better understand the various influences on human health. Many of the studies coming out of epidemiological, biological, and public health disciplines put forth explanatory models for disease outbreaks that focus largely on biological risk factors to health and are hierarchical or directional. Medical geographers and other environmental scientists, interested in health problems, typically focus more on climate and geographic patterns of disease. Similarly, sociologists and anthropologists tend to

focus heavily on cultural or social factors on health patterns. Many of these approaches focus on only certain aspects of health or risk factors, while ignoring or simplifying the complex interpretations between factors in the overall state of health. Bioarchaeology allows for scholars to extend interpretations of the state of health to past populations, but in order to accomplish this effectively, researchers must build and apply a multidisciplinary framework so as to present a holistic model of the state of health in the past.

Quackenbush, William (Ho-Chunk Nation)

[96]

Discussant

Quates, E. W. Duane (USDA-Natural Resources Conservation Service) and Charlotte Cable (Michigan State University)

[185]

At the Intersection of Archaeology, Conservation, and Policy: What We Can Learn from W. C. Lowdermilk

W. C. Lowdermilk, PhD, the first Assistant Chief of the Soil Conservation Service (SCS; now the Natural Resource Conservation Service [NRCS]) in 1938–1939 conducted an 18-month study through several countries culminating in the 1953 publication of “Conquest of the Land through 7,000 Years,” which relies on archaeological evidence to argue that the lack of soil conservation was the catalyst for the fall of many empires and civilizations. In so doing, Lowdermilk solidified the purpose of the SCS and the justification of the Soil Conservation Act. Lowdermilk observes that agriculture is the foundation for civilization and since agriculture requires healthy soil, it follows that soil conservation is required for civilizations to survive. Lowdermilk draws extensively on interviews with archaeologists and on his own research to argue that civilizations rise or fall based on their (mis)management of soils. He provides numerous examples of cities and states in the Near East, Asia, and Africa that collapsed or were indelibly marked by the effects of soil erosion, salinization, siltation, and sedimentation, as well as provides ancient examples of successful soil conservation. The authors evaluate Lowdermilk’s argument, his evidence, and his conclusions to ask, “What role does archaeology play in natural resource conservation policy?”

Quave, Kylie [242] see Hoover, Corey

Quezada, Osiris (UNAM) and Grégory Pereira (ArchAm-CNRS)

[20]

Las fuentes prehispánicas de dacita de la región de Zacapu Michoacán: El análisis del complejo de “Las Minas”: Métodos y técnicas de extracción

Durante las actividades más recientes de prospección en la zona de Zacapu Michoacán, en el Proyecto Uacúsecha, se tres identificaron complejos prehispánicos de minas-taller al noreste de la cuenca, emplazados sobre dos antiguas coladas volcánicas de dacita. El empleo de la dacita como materia prima para la manufactura de instrumentos líticos se ha registrado en sitios de la región desde la fase Loma Alta (100 a C al 550 dC) hasta la fase Milpillás (1200 a 1450 dC), y los artefactos se han localizado en contextos domésticos y funerarios. El desarrollo de un estudio específico y orientado en el análisis de estos complejos mineros, nos ha permitido no sólo documentar las trazas físicas de la remoción sistemática de piedra, sino también caracterizar tales evidencias, y con base en ello, determinar la existencia de diferentes métodos, las técnicas empleadas en la extracción y los indicios de las fases iniciales de la cadena operativa. Nuestra exposición se enfoca en los métodos de extracción registrados y las evidencias y los indicios relacionadas con la organización espacial, con énfasis en el complejo “Las Minas”, en el cual hemos hecho un estudio profundo y sistemático de prospección, verificación LIDAR y excavación.

Quilca, James [268] see Silva Sifuentes, Jorge

Quilter, Jeffrey (Peabody Museum, Harvard University)

[106]

Discussant

Quinn, Allen [222] see Freund, Kyle

Quinn, Colin [253] see Goodale, Nathan

Quinn, Colin [35] see Hayes, Vivienne

Quinn, Colin [35] see Langston, Jada

Quinn, Colin [5] see Pike, Sabrina

Quintana Moranes, Eréndira [22] see Welker, Martin

Quintus, Seth (University of Hawaii at Manoa)

[226]

Deconstructing Ecological Narratives and Reconstructing the Relevance of Archaeology by Centering Ecological Inheritance in Education

Ecological transformations are a hallmark of education in the life science. The narratives employed in these disciplines frequently lack the historical perspectives archaeologists provide, using conceptual frameworks that discount or limit the impacts of human land use across deep time. When archaeological data are employed in classrooms, too often the narratives built are used as cautionary tales of what could happen to us in the future, creating separation between what people did in the past and our understanding of the contemporary environment. Even though archaeology has sought to increase its relevance, undergraduate and graduate students are rarely able to articulate how archaeological research can help solve or understand contemporary problems. I argue that the relevance of archaeology is enhanced through the use of the ecological inheritance concept as a central theme in archaeological education. The concept of ecological inheritance allows teachers and students to question or deconstruct ahistorical themes of ecological education, such as forest succession and biological invasion, while at the same time linking the past and the present in a tangible way. This is especially important in island environments where contemporary landscapes clearly illustrate the importance of ecological inheritance.

Quiroz, Carlos (St. John's College/Maya Research Program), Lara Sanchez Morales (UT Austin), Timothy Beach (UT Austin), Samantha Krause (Texas State University) and David Lentz (University of Cincinnati)
[206]

Lidar and the Birds of Paradise North Platform: A Gateway to Understanding the Canal and Field Complexes of the Ancient Maya
The Birds of Paradise fields is a system of extensive wetland canal and field complexes at the eastern base of the Rio Bravo escarpment in northwestern Belize. The Birds of Paradise (BOP) North platforms were discovered while ground verifying lidar imagery of rectilinear features in the palmetto and tall grass savanna along the Rio Bravo. The imagery did not show these platforms, but rather indicated a north-south linear feature, perhaps a causeway, spanning the savanna across the Rio Bravo to the riparian forest along the eastern edge of the BOP wetland canal and field complexes. Small scale excavations and mapping of these features began in 2017. This paper presents the geoarchaeological contexts, including the surrounding midden-mounds and canal complexes, and macrobotanical, faunal, geochemical, stratigraphic, and wood findings. The focus of this discussion is one platform in particular that lies near the northeast edge of the BOP wetland field network, 2.5 km east of the Postclassic site of Akab Muclil at the north end of the possible causeway. This paper discusses the recovery of a wide range of artifacts, macrobotanicals of many wetland species, and wooden posts in an excellent state of preservation.

Quiroz, Itzel (University of Oregon), Richard Rosencrance (University of Oregon), Katelyn McDonough (Texas A&M University) and Justin Holcomb
[66]

Younger Dryas Eyed Bone Needles, Spurred Gravers, and Activity Areas at the Connley Caves (35LK50), Oregon
Eyed bone needles are found in association with spurred gravers at Paleoindian sites throughout North America. These artifacts provide a unique insight into past forager technological activities and daily life during the Late Pleistocene. University of Oregon excavations have recovered 10 bone needles with associated gravers and abraders from Younger Dryas-age (ca. 12,900–11,600 years ago) deposits containing Western Stemmed Tradition (WST) artifacts at the Connley Caves in the Fort Rock Basin, Oregon. In this poster, we: (1) examine the morphology and manufacture of the Connley Caves bone needles, spurred gravers, and abraders via morphometric data; (2) examine spatial relationships and possible activity areas at the Connley Caves; and (3) consider the relationship to other bone needles found at WST sites across the Intermountain West. These data will clarify human activities at the Connley Caves and contribute to the broader understanding of northern Great Basin Paleoindian lifeways during the Younger Dryas period.

Rabinow, Sophie (Simon Fraser University)
[244]

Faunal aDNA Analysis to Determine Precolumbian Mobility Networks in the Caribbean
Due to its isolation from the continent, the Caribbean offers a unique opportunity to acquire an in-depth understanding of the region's extensive precolumbian mobility networks. However, the proximity of the islands with the continent and amongst each other, as well as the extensive nature of such networks, confounds the extent of this mobility. The agouti (*Dasyprocta* sp.) and opossum (*Didelphis marsupialis*) were introduced to the Caribbean from the South American continent in Pre-Columbian times and possess a widespread archaeological presence in the Lesser Antilles islands. Analyzing the genetic variation of these commensal species can provide insight to the mobility of precolumbian groups. Recent analyses of guinea pig (*Cavia porcellus*) mtDNA by Kimura et al. (2016) and Lord et al. (2018) have established the value of applying the commensal model in the Caribbean, demonstrating the need for studies involving a broader range of taxa. Until now guinea pig has been the only taxa used as a proxy for the commensal model in the Caribbean. This study is the first to conduct the analysis of agouti and opossum aDNA from eleven islands in the Lesser Antilles chain and provide novel genetic evidence toward understanding mobility networks in the precolumbian Caribbean.

Rabinowitz, Adam (University of Texas, Austin), Ryan Shaw (University of North Carolina at Chapel Hill) and Patrick Golden (University of North Carolina at Chapel Hill)
[24]

Temporal Reasoning and Visualization across Periodized Archaeological Datasets: The Potential of the PeriodO Gazetteer
This paper explores the potential of the PeriodO period gazetteer to facilitate temporal reasoning in archaeological datasets, initially within and between stratigraphic databases that refer to PeriodO definitions for their period terms, and eventually within and between datasets using only natural-language labels. The application of temporal logic to the stratification of archaeological sites is a longstanding practice, but it has generally been carried out on a narrative basis or through tools such as the Harris Matrix. The widely varying temporal scales of the units of observation, from a coin dated to a specific year, to a radiocarbon date range, to a general stylistic period, have, however, made it difficult to automate the capture and visualization of formal temporal-logical

relationships between deposits at a single site, let alone across multiple sites. In spatial operations, the use of Linked Data gazetteers has facilitated such operations, and this paper proposes that the same could be true for temporal relationships. We sketch out some paths toward the computational use of PeriodO identifiers in the validation of relative and absolute dates in stratigraphic datasets, the establishment of chronological sequences on the basis of temporal logic, and the comparison of these sequences across multiple datasets.

Rabinowitz, Adam [169] see Wright, Sterling

Radde, Hugh [72] see Herr, Sarah

Rademaker, Kurt (Michigan State University), Emily Milton (Michigan State University), Kendal Albrecht (Michigan State University) and Sarah Meinekat (University of Tübingen)

[180]

Visualizing Cuncacha, a Terminal Pleistocene Residential Base Camp in the High Peruvian Andes

Cuncacha rockshelter is the highest-elevation Pleistocene archaeological site known in the Americas (4,480 m above sea level). Excavations from 2010 to 2015 documented a stratified sequence of occupation components spanning from 12,500–12,000 years ago to recent times. These components are represented by rich assemblages of faunal and botanical remains, lithic and other artifacts, human burials, and anthropogenic sediments. The site's location in the oasis-like Pucuncho Basin, structure of biotic and other resources in the environment, richness of the material remains, and many behavioral signatures indicate that Cuncacha functioned as a residential base since the Terminal Pleistocene. As archaeologists working on specific sites for years or decades, we become intimately familiar with a site's setting in its landscape, its internal features, and spatial distributions of material remains. It is sometimes challenging to convey this information, often detailed or impressionistic, to others who have never visited the region or site. Here we present the site of Cuncacha from the landscape to the microscopic scale, with information assembled over the past 10 years of field and lab research. We invite feedback and suggestions from others on how this and other hunter-gatherer sites might be displayed effectively through 2D visual media.

Rademaker, Kurt [67] see Gruver, Steph

Radican, Kelsey, Alejandra May (Purdue University), Jennifer Miller (Max Planck Institute), Jessica Thompson (Yale University) and Elizabeth Gomani-Chindebvu (Department of Museums and Monuments, Lilongwe)

[38]

Bead Production of the Later Stone Age in Northern Malawi

Later Stone Age (LSA) bead production is typically reported with ostrich eggshell (OES) as the primary raw material. In south central Africa land snail shell (LSS) was also used, but most sites have uncertain and poorly-dated associations. The Malawi Ancient Lifeways and Peoples Project has now recovered both OES and LSS beads and preforms from securely-dated LSA contexts at the Hora 1 and Mazinga 1 sites in the Mzimba District of northern Malawi. This shows that beads from both materials were made on site, as part of LSA technological behavior. However, both OES beads and unmodified OES are restricted to Pleistocene deposits. In the Holocene, LSS replaces OES as the sole raw material for bead production, and a directly-dated preform from each site shows that this change took place at least by ~9500 cal BP. Bead production pathways also differ between the two time periods within the LSA, with pathway 1 (where blanks are first drilled and then shaped) dominating OES production and pathway 2 (where shaping precedes drilling) dominating LSS production. These results show how raw material availability and material properties influenced technical decision-making at different times across the LSA.

Rae, Todd [159] see Briggs, Emily

Rafidi, Brianna (Arizona State University)

[99]

Soul Concepts of Postcolonial Woodland and Plains Indians II: A Systematic Survey of Concept Intercorrelations, Meta-themes, and Regional Traditions

A survey of ethnographic literature on 49 historic Woodland and Plains Indian tribes from nine language families was conducted to learn the variations in their ideas about human soul-like essences. A total of 632 cases documented nine selected variables, four of which are described here: qualities and capabilities of souls while an individual is alive versus when an individual is dead and functions and activities of souls when they are inside the body versus when they are outside of the body. These attributes of souls are too numerous to describe individually, but are summarized here by the following 10 meta-themes: linkage to life, the nature of souls' existence after death compared to existence during life, soul movement in and out of the physical body, ghosts, agency, communication, morality, power, materiality, and desires and emotions. Also presented are two area-wide intercorrelations: between the number of souls an individual is thought to have and the souls' fates at death, and between the bodily locations of souls and their functions, activities, and qualities. Finally, concepts that were restricted geographically to the Northeast, Southeast, or Plains and that define these areas as regional cultural traditions are enumerated.

Railey, Jim (SWCA, Albuquerque)

[194]

Raw Materials and Time: Lithic Assemblage Patterning in a High-Elevation Area of Western New Mexico

Lithic-artifact assemblages in the North American Southwest are shaped by at least three factors: raw material conditions in the

surrounding landscape, temporal changes in projectile weaponry, and site function within varying settlement/mobility contexts. A recent survey in a high-elevation volcanic landscape in western New Mexico found evidence of considerable Early and Middle Archaic activity, focused on testing, reduction, and use of local basalt (or dacite), including numerous bifaces and projectile points. By Late Archaic times, most projectile points are chert or other finer-grained materials, apparently from non-local sources. Analysis of data recorded in the field revealed quantitative patterning reflecting the three factors of raw material conditions and temporal variation—including a shift to use of high-elevation areas during the Altithermal.

Railey, Jim [177] see Larsen, Andrew

Rainville, Charles and Asa Randall (University of Oklahoma)

[63]

Geophysical and Spatial Investigations of a Woodland Period Post Mold Alignment at the Silver Glen Springs Archaeological Complex, Florida

The landscape of the Silver Glen Springs Archaeological Complex has been extensively modified for at least 9000 years, including the construction of shell mounds and wooden post structures. The focus of previous research at this complex on reconstructing the massive Shell mounds and monuments along the spring run has left the non-mounded areas under investigated. During the summer of 2018, a joint University of Oklahoma and University of Florida field school conducted a multi-sensor geophysical investigation of the non-mounded areas, including ground-penetrating radar (GPR) and magnetic gradiometry. An oval alignment of anomalies was revealed in the magnetic gradiometry data. Targeted test unit excavations identified post-molds and deep pits, corroborating the geophysical data. The geophysical data were then post-processed and further investigated using spatial statistical methods in ArcGIS. The results suggest that the post-mold alignments, as well as other archaeological signatures at this site, have a distinct architectural logic in their relation with each other and the complex writ large. This poster will argue that the geophysical and excavation data tie the post alignment into the collection of monuments at the Silver Glen Springs archaeological complex, and these monuments are part of a larger interconnected landscape of memory.

Raja, Mussa [250] see Bicho, Nuno

Raja, Mussa [11] see Haws, Jonathan

Rakita, Gordon (University of North Florida)

[87]

Moderator

Rakotozafy, Lucien [76] see Hixon, Sean

Rakowski, Rebekah (Idaho State University), Kateea Peterson (Idaho State University) and John Dudgeon (Center for Archaeology, Materials and Applied Spec)

[120]

Mapping Ceramics: A Multimodal Petrographic Analysis of Various Ceramics Utilizing ArcGIS

Ceramic petrography uses methods and techniques developed in the geological sciences to investigate material properties of ceramics, including mineralogical and organic additives, clay matrix, and clues to the method of manufacture. Additional information about the ceramic body, including major and minor elemental composition, grain orientation and distribution of clays, temper additions, and surface treatments can also be visualized using scanning electron microscopy with energy dispersive spectroscopy (SEM-EDS). These macro- and micro-scale imaging and analysis methods can be further augmented by molecular and trace elemental approaches, supplementing SEM-EDS and optical petrographic analysis. In this study, Geographical Information System (GIS) mapping techniques in ArcGIS were used to present various classes of data on the ceramic body through the creation of ceramic maps. Images captured with the SEM were digitized to show chemical compositional variation through and between ceramics. Ceramic maps were also created to highlight areas of interest, including unique or changing ingredients in the clay, temper, and decoration. In addition to comprehensive reports, ceramic maps also aid in public outreach by giving people an easy to understand visual aid for the comparison of various ceramic types, leading to a better understanding of the importance of petrographic analysis in archaeology.

Ralston, Clair, Debra Martin (University of Nevada, Las Vegas), Pamela Stone (Hampshire College) and Ventura Pérez (University of Massachusetts, Amherst)

[131]

Recovering "Los Antepasados": Bioarchaeology of a Historic Genízaro Community in Colonial New Mexico

The Nuestra Señora de Belén Archaeological Project explores a colonial mission church and plaza site dating to the late eighteenth and nineteenth centuries in Belén, New Mexico. The colonial village of Belén was populated by a diverse community of Spanish and mixed-heritage individuals, including a number of Native-American freed servants known as Genízaros. The bioarchaeological component of this multi-year project focuses on the reconstruction of the lived experiences of this community of individuals who were marginalized from both Native American and Spanish communities and whose stories have been obscured by colonial and civic narratives. This project is a multidisciplinary cooperation that engages the local community by involving them in the research process, expressly recognizing their voices and position as stakeholders in how these stories have been and will be told. My work on this project was encouraged by Dr. Martin, who challenges those she mentors to be not only competent and productive researchers, but impactful, diverse, and relevant scholars. She inspires me to identify research questions that tie into broader issues

relevant to contemporary populations, particularly those addressing the social meanings underlying disparities in experiences of health, disease and violence. That ethos resonates strongly throughout all aspects of this project.

Ramirez, Estevan (University of California, Riverside) and Kenichiro Tsukamoto (University of California, Riverside)

[7]

Photogrammetric Documentation of Burials at the Archaeological Site of El Palmar, Mexico.

The application of photogrammetry has been a growing interest in archaeological research. Among different archaeological contexts, burials highlight the effectiveness of photogrammetry for fieldwork. This poster aims to represent how the combination of photogrammetry, total station, and GIS document mortuary contexts in the most efficient manner, not only creating three dimensional models, but also georeferencing the entire context. We recovered two burials from the south room of the Guzmán Group's Structure GZ7, an outlying group of the El Palmar archaeological site, which is located in Campeche, Mexico. The results created three dimensional models of different burial layers as well as georeferenced drawings in ArcGIS.

Ramírez Galicia, Alfonso [198] see Martínez Vázquez, Dante Bernardo

Ramon Celis, Pedro (Indiana University Bloomington)

[204]

Archaeology of Respect, Site Meanings, and Land-use Practices in Guiengola, Oaxaca: Foundations for a Collaborative Project

During two field seasons in 2018 and 2019, I have been documenting both archaeological and ethnographic data of Guiengola, a mountain where the Zapotecs built a fortress during the fifteenth century, located near the town of Tehuantepec, Oaxaca. The objective of this particular research is to understand the significance of the area for the local population, and with that in mind, develop an archaeological project that is meaningful for the Tehuantepec people. Archaeologists have the social duty to document the material record along with collaborating meaningfully with community members who may have a range of public interests and concerns. The goal is to open a dialogue, especially with the descendant populations in the places we work. In this paper, I will present my experiences working with the 'Comuneros del barrio Lieza' the landowners of the mountain, whom with I made archaeological reconnaissances, but also join them on their own expeditions to the area in order to understand how they experience the place. I expect that by understanding people's knowledge and experiences working in Guiengola, I will be able to improve public engagement and collaboration and open new ways to do meaningful archaeological projects.

Ramos Berrios, Alanis, Beatrice Lozano (University of Texas, Arlington) and Robert Lassen (AmaTerra Environmental Inc.)

[37]

A "Young" Ultrathin Biface: Comments on Paleoindian Lithic Technology

Way Ranch (41HY519) is a multicomponent site located in Hays County, Texas. This research focuses on stone tools found in the rockshelter portion of the site, which is approximately 950 m northeast of the primary excavation blocks. The rockshelter is located beside the Blanco River and is composed of a Cretaceous limestone overhang above a shallow alcove. A large hearth in the shelter yielded charcoal corresponding to the Late Archaic (1880 ± 30 and 1930 ± 30 RCYBP), and a Late Prehistoric Perdiz point was recovered among other tools. Among this material, excavations also uncovered a finely made bifacial knife. The biface is wide and thin, reminiscent of ultrathin bifaces from Folsom contexts across the Great Plains. While the Way Ranch biface is Late Archaic to Late Prehistoric in age, its apparent similarities to the far older tools raise a number of questions. Were Folsom and some later lifeways similar enough to utilize similar technologies? Are such bifaces associated with bison hunting, and if so, do they occur in other technologies? And just how "special" is Paleoindian technology? This research compares the Way Ranch biface to Paleoindian and other examples to assess possible biases in our interpretations of lithic technology.

Ramsey, James

[101]

Bonfire Shelter: A Zooarchaeological Reevaluation of Bone Bed 2

Bonfire Shelter is a rockshelter in Eagle Nest Canyon, a short tributary of the Rio Grande in West Texas that contains three distinct bonebeds of varying ages. The middle bonebed, Bone Bed 2, is a Paleoindian-aged deposit dating to ~12,000 years BP. Bone Bed 2 was originally interpreted as the remains of one or more bison mass kills; however, this interpretation has been heavily contested. Current investigations focus on the zooarchaeological findings of the ASWT Project's 2019 field season at Bonfire Shelter to reassess accuracy of earlier interpretations. The bison assemblage was examined with respect to utility indices and butchering patterns to determine trends in carcass transport and utilization. Data collected from both current and previous excavations were combined in order to create an up-to-date age profile for the assemblage. These results will shed more light on the herd structure present in the assemblage and provide information on Paleoindian carcass processing strategies. The implications for site interpretation that arise when that data is integrated with the previous research are also discussed.

Ramsey, Monica (University of Cambridge)

[171]

Contrasting Inherited Ecologies: Wetland and Dryland Exploitation in the Transition to Plant-Food Production

This paper presents new phytolith evidence of Levantine Epipaleolithic (ca. 23–10.5 ka cal BP) plant-use to consider how ecological inheritance may have facilitated the non-linear transition to plant-food production. Phytoliths provide direct botanical evidence of plant-use and demonstrate that Epipaleolithic peoples employed a risk-reducing wetland-based adaptation, with shifting emphasis through time on the surrounding dry-land grass resources depending on changing micro-environmental opportunities. This wetland-based adaptation produced a positive feedback, increasing human impacts on the wetlands, which made them increasingly

productive compared to their dry-land surroundings for human exploitation. In this highly contrasted environment, wetland niche construction resulted in an ecological inheritance, which likely initiated other socioeconomic developments, including increasing sedentism, strengthening social ties to place, and the rise of recognizably modern “cuisine.” The persistence of these socioeconomic advances, the long-term residual effect of this ecological inheritance, may explain how the nonlinear “fits-and-starts” development of plant-food production continued through the Epipaleolithic.

Randall, Asa (University of Oklahoma)

[23]

“The past is never dead, it’s not even past”: The Archaic Southeast in a Post-Archaic world

Stadial thinking embedded in archaeological periodization promotes the rupture of lived experience from landscapes of past practice. Whereas an earlier generation of scholarship viewed the Archaic period as the precondition for structural developments in a post-Archaic world, recent work across southeastern North America demonstrates that Archaic forebears provided objects, places, and landscapes rife with the potential for reflection and politicization. Evidence for ancient archaeologies in the form of object gathering, pit digging, citations, and reproductions highlight the ways in which continued engagement with Archaic materials and places were generative of new experiences and traditions.

Randall, Asa [63] see Rainville, Charles

Rankin, Caitlin (Washington University in St. Louis)

[59]

The Resilience of Floodplains to Sustained Regional Drought: Implications for the Vacant Quarter

The Vacant Quarter defines a period of pan-regional abandonment of the central Mississippi and lower Ohio River Valleys between AD 1350–1500. The Vacant Quarter does not propose a complete depopulation of the region, but rather highlights the decline in mound-building activities and the abandonment of ceremonial centers throughout the region. Cahokia Mounds, the largest ceremonial center of the Mississippian Cultural Tradition, was one of the earliest large mound centers abandoned in the Vacant Quarter region. Regional environmental proxies of pollen, tree rings, and stable isotopes indicate sustained, multidecadal periods of drought in the Vacant Quarter region that temporally correlate with the onset of the Little Ice Age. These regional environmental proxies have been used to argue for climatic influence as a potential contributing cause to the Vacant Quarter abandonment. In this paper, I present new multi-proxy paleoenvironmental datasets collected from a wetland mound and plaza group in the central precinct of Cahokia Mounds. These data indicate the local ecologic resilience of floodplains to broader regional patterns of sustained drought. This new dataset complicates the middle-range theory of food surplus previously used to link patterns of climatic change to decline in social complexity during the Vacant Quarter.

[59]

Chair

Ranum, Caleb [147] see Hatcher, Lawford

Rapes, John (Purdue University), Jack Hofman, Lawrence Todd, Daniel Dalmás and Barbara Crable

[236]

Selective Use of Local Silicified Stone in the Absaroka Mountains, Washakie Wilderness, Northwest Wyoming

Silicified sediments (SLS) occur in localized deposits throughout much of the Greater Yellowstone Ecosystem where veins of molten volcanics came into contact with silica rich sediments forming a variety of metamorphic contact materials, which are here all grouped into the SLS category. These materials commonly served as tool stone and provided alternatives to transporting non-local materials into high elevation areas. The quality of SLS varies greatly, ranging from coarse grained and brittle with poor conchoidal fracture to rarer high-quality materials comparable to fine cherts. Here we review the chronological patterns of SLS utilization as revealed by diagnostic artifacts from both surface assemblages and excavated samples, summarize the variety of artifact types represented by SLS, the overall frequency of SLS as compared to other materials, and document one workshop/quarry site in the Washakie Wilderness that illustrates some of the variability and uses of this tool stone.

Rapes, John [55] see May, Alejandra

Rapes, John [176] see Torquato, Melissa

Rareshide, Elisabeth (University of California, Santa Barbara)

[254]

Chair

Rareshide, Elisabeth [254] see Minerbi, Joanne

Rashed, Tarek [248] see Arias, Veronica

Rasic, Jeffrey (National Park Service)

[253]

Lithic Source Types as Driving Factors in the Character of Regional Archaeological Records

Archaeologists often ponder the ways lithic production and procurement strategies are driven by the nature of lithic raw material attributes such as quality, size, shape, and abundance. This paper explores three case studies, obsidian sources in Alaska, to address ways that lithic raw material source attributes may, in fact, have driven technological and economic choices and, in turn, shaped the fundamental character of regional scale archaeological records.

Rasic, Jeffrey [82] see Reuther, Joshua

Raskevitz, Thornton (Oklahoma State University) and Carlos Cordova (Oklahoma State University)

[75]

Reconstructing Paleoecology by Proxy: Phytolith Analysis and Its Utility When Examining Bison Diminution on the Great Plains
Bison have been the keystone herbivore in the Great Plains region since the disappearance of the mammoths during the terminal Pleistocene extinction event. This extinction thrust them into a role as both the managers of a changing environmental landscape and as the most important animal resource for the established human populations. Since the end of the Pleistocene, the genus *Bison* underwent significant anatomical and behavioral changes. This study examines opal phytoliths embedded in dental calculus of prehistoric bison specimens as proxy for reconstructing environmental context of anatomical and behavioral changes underwent by the Great Plains bison since the terminal Pleistocene. The strategy includes comparing prehistoric phytolith assemblages with those of modern bison in various types of grasslands. The paleo-bison examined were sourced from the Beaver River Bison Hunting Complex, the Ravenscroft II Bison Kill Site, in Oklahoma, and the Folsom Site, in New Mexico. The spatial differences between the kill sites in terms of paleoclimate and floral assemblage were also quantified.

Rautman, Alison (Michigan State University)

[88]

Moderator

Ravotto, Alessandro [159] see Turcanu-Carutiu, Daniela

Rawski, Zoe (University of Texas, San Antonio)

[158]

Situating Early Xunantunich, Belize, in the Preclassic Landscape: A Synthetic Perspective from Structure F1
Over the last five years, intensive investigations of Structure F1 at Early Xunantunich, Belize, have shed light on a dynamic and important time in the site's early history. The monumental platform structure played an important role in the early ceremonial center, creating the site's northern boundary, hosting large public rituals and, potentially, bearing associations with the emergence of a royal dynasty at the site in the Late Preclassic period. In this paper, we present the results of recent analyses which situate the structure's history within a regional sociopolitical and economic context during the Middle and Late Preclassic periods. This context includes ceramic affiliations as well as other exchange networks of non-local materials such as obsidian, greenstone, and marine shell. Further, we synthesize the entire research program in light of these new findings, exploring the ways in which ritual performances in this space laid the foundation for increasing sociopolitical inequality during the Middle and Late Preclassic periods. These findings are further contextualized within the Early Xunantunich ceremonial center, as well as within the Preclassic Maya landscape more broadly. Finally, future directions are explored in order to identify how we might better understand this important early structure.

Ray, Agnes (Ohio Valley Archaeology Inc.)

[176]

Red Ochre in the Midcontinent

A number of studies have indirectly addressed the occurrence of red ochre within mortuary contexts in the archaeological record, but this work has predominantly focused on the concept of the Red Ochre cultural complex and the transition from Late Archaic to Early Woodland culture periods in the Great Lakes Region. In their 2009 review of Archaic burial sites in the American Midcontinent, George R. Milner, Jane E. Buikstra, and Michael D. Wiant describe the practice of marking human remains with red ochre as having, "a considerable temporal and geographical distribution, although it was certainly used more in some times and places than in others." In order to better define these "times" and "places," a cursory survey of the extant literature regarding Native American mortuary practices across the American midcontinent has been undertaken and the preliminary data presented here. It is hoped that by observing documented occurrences of this specific behavior on a larger temporal and geographical scale a better understanding of the movement and persistence of ideas can be gained.

Ray, Erin [137] see Moyes, Holley

Ray, Erin (University of New Mexico), Paige Lynch (University of New Mexico), Emily Moes (University of New Mexico) and Keith Prufer (University of New Mexico)

[233]

Changes in Weaning Age from Hunter-Gatherers to Agriculturalists: A Stable Isotope Study in Southern Belize

In Mesoamerica, the advent of agriculture brought unprecedented population expansion. However, a lack of archaeological remains from this period has made it challenging to determine when population growth began. A transition in weaning practices from hunter-gatherers to agriculturalists may have contributed to changes in life history strategies, potentially facilitating population growth. Two rockshelter sites, Saki Tzul and Mayahak Cab Pek, located in Southern Belize, contain a continuous burial assemblage spanning

approximately 9,000 years. They provide a unique opportunity to examine demographic changes during the transition to agriculture. Stable isotopes of carbon and oxygen from molars and premolars in adults spanning are used to examine changes in age of weaning. By sampling enamel from different teeth with differing mineralization ages we can identify the addition of water to the diet and introduction of adult diet. The addition of drinking water results in depleted oxygen isotopes whereas the adult diet results in an enrichment of carbon isotopes. If the introduction of maize provided a stable food source for infants, then nursing cessation may have occurred earlier in agricultural populations thus decreasing interbirth interval and increasing overall fertility and population growth.

Rayfield, Kristen (University of Oklahoma), Lushuang Huang (University of Oklahoma), Hayley Lanier (University of Oklahoma), Si Wu (University of Oklahoma) and Courtney Hofman (University of Oklahoma)
[244]

A Proteomic Approach to Determine Sex in Zooarchaeology

Sex determination from animal skeletal remains can be challenging as it relies on sex specific bones or osteometrics. Determining sex is beneficial in understanding animal husbandry practices, as well as human-animal interactions. Building on previous work with humans, here we present a proteomic approach for determining sex from tooth enamel in non-human mammals. The protein amelogenin, which makes up 90% of the tooth enamel, is dimorphic and coded by the X and Y chromosomes. The protein products of the X and Y gene have been recovered in human tooth enamel and used to determine sex with the absence of the Y protein. This proteomic method has been shown to be less expensive and less destructive than genetic analysis from teeth, which has potential for allelic dropout. To evaluate this approach in non-human mammals, four mammalian species (dogs, coyotes, beavers, and deer) were tested in a blind study from research collections in the Sam Noble Oklahoma Museum of Natural History. Mass Spectrometry was applied to identify the amelogenin protein. We present here the findings of this experiment and further characterize species specific amelogenin proteins. Our research demonstrates how proteomic characterization of the amelogenin can be broadly applied to zooarchaeology.

Rayfield, Kristen [169] see Wright, Sterling

Raynal, Jean-Paul [30] see Fernandes, Paul

Read, Sara

[87]

Moderator

Ream, Randy (AUSA - WDKY)

[92]

Discussant

Reamer, Justin (University of Pennsylvania)

[269]

"A River Runs through It": Reinterpreting Late Woodland Settlement Patterns in the Upper Delaware Valley

Rivers are important natural boundary markers that in modern contexts commonly form political boundaries. River drainages are also important in archaeological practice as they are commonly used to delineate archaeological culture areas. In eastern North America, river drainages are used for both purposes. In the history the discipline, many archaeologists have defined where they work by both the local river drainage and the state. But commonly archaeologists have focused their research only in one state, and thus, when working in a river drainage separating states, only on one side of the valley. In this paper, I will examine how this practice of only working on one side of a river valley has influenced archaeological interpretations and fueled intra-regional debates. Specifically, I will focus on how archaeologists working in the Upper Delaware Valley have reached different conclusions about settlement patterns during the Late Woodland by drawing their data only from sites in either Pennsylvania or New Jersey. I will then re-analyze feature data from excavated sites on both sides of the Upper Delaware River to examine how each side of the valley may have been used differently during the Late Woodland and what this implies about settlement patterns during this period.

Reaux, Derek (University of Nevada, Reno)

[195]

An Application of a Lithic Gravity Model in the Catnip Creek Delta, Guano Valley, Oregon

Lithic source provenance analysis has featured prominently in Great Basin Paleoindian archaeology for the past few decades. This research has primarily focused on reconstructing Paleoindian settlement/subsistence strategies, territoriality, and socioeconomic interactions by sourcing obsidian artifacts from sites and mapping their geographic distributions. While these studies have demonstrated which toolstone sources were used by early groups and how they may have been conveyed, few have explicitly addressed why those particular materials were selected in the first place. In this paper, I present a gravity model that examines the influence that geologic and geographic factors (e.g., toolstone quality, abundance) have on Paleoindian lithic procurement strategies in the Catnip Creek Delta Locality, Guano Valley, Oregon. The gravity model approach offers a novel way to analyze source provenance data and it may allow us to reassess the current debates about Paleoindian settlement/subsistence strategies in the Great Basin.

[195]

Chair

Reaux, Derek [195] see Sturtz, Sara

Rebbe, Claire [63] see Tolan, Grace

Redding, Richard (Kelsey Museum, University of Michigan)

[22]

Provisioning, Production, and Parallel Economies in Old Kingdom Egypt

Excavations at the Old Kingdom sites of Kom el-Hisn, the Nile Delta, and Heit el-Ghurab, at Giza, have yielded faunal data providing insights into the Old Kingdom economy and infrastructure of pyramid construction. Kom el-Hisn was a production site that predominately shipped, young male cattle, sheep and goats to the site of Heit el-Ghurab, which housed workers laboring on the Pyramid Complex of Menkaure. The workers at Heit el-Ghurab were provisioned by the central authority and were not involved in any food production activities. The residents of Kom el-Hisn had limited access to the animals they were rearing and engaged in pig rearing to provide animal protein for local consumption. The central authority was not interested in the local system of pig production as it could not be mobilized. Pig production in Egypt formed a parallel economy: a heterarchy as opposed to the hierarchy imposed by the central authority.

Redman, Kimberly (Alpine Archaeology)

[253]

Experiments in CRM

Graduate programs focused on Cultural Resource Management (CRM) were relatively rare in the late 1990s. The Washington State University Anthropology graduate program, of which Dr. Andrefsky was a part, provided a platform that prepared many students for a career in CRM. Practical experience in field and laboratory techniques, coupled with a focus on analytical thinking and writing, exemplify the preparations needed for CRM. In addition to experiments in a CRM-like environment, Dr. A provided training in lithic analysis and interpretation and the use of experiment-based studies to further our understanding of lithic debitage assemblage creation. Lessons learned continue to inform lithic experiments in a CRM context.

Reed, Paul (Archaeology Southwest)

[229]

Expanding our Approaches to American Archaeology: An Example from the Greater Chaco Landscape, New Mexico

American archaeology has been in the midst of a transition for more than a decade. Long-suppressed and ignored viewpoints are finally seeing light and interpretations are broadening. In particular, archaeologists are working with Native peoples with new and innovative approaches to understanding the past. As a result, archaeology is changing, although the pace of change is slow. In this presentation, I offer an example from the Greater Chaco Landscape in New Mexico. By working with different Indigenous groups over the last several years, we have increased our understanding of ancestral land use and the great time-depth of connections to Chaco Canyon and the Greater San Juan Basin. This work has also revealed the severe limitation of a Western-based, colonial approach to the past and illustrates the need for more comprehensive changes to our discipline.

[229]

Chair

Reeder-Myers, Leslie (Temple University)

[59]

Zooarchaeological Meta-analysis and Late Holocene Climate Change on Chesapeake Bay

In many parts of the world, individual archaeological sites rarely yield sufficient faunal data to provide a full picture of resource use over hundreds or thousands of years. In the eastern United States, acidic soils and centuries of farming result in poor faunal preservation, and archaeologists have tended to focus on better preserved ceramic and lithic artifacts to answer questions about cultures in the past. However, zooarchaeological studies in cultural resource management or field school reports, when considered in total, provide an impressive diachronic, regional view of resource use. A case study from the Chesapeake Bay explores the value of these data, particularly when compared with a remarkably high-resolution climate record for the Late Holocene. After overcoming challenges related to the comparability of data, results suggest a remarkable amount of variability among sites, with no clear patterns related to major climate events such as the Medieval Climatic Anomaly or the Little Ice Age, even though those events had a powerful impact on the climate of Chesapeake Bay. This type of analysis provides useful insights, even in the absence of large-scale research focused on the impact of climate change on ecosystems and cultures.

Reeder-Myers, Leslie (Temple University)

[88]

Discussant

Reeder-Myers, Leslie [172] see Petras, Elysia

Reedy, Chelsea (Texas State University)

[241]

Food and Fortitude: A Story of Life within Presidio San Sabá as Told through Zooarchaeological Analysis

Presidio San Sabá was the largest military outpost in the Texas region during the mid-eighteenth century. This research project is a continuation of Dr. Fradkin and Dr. Walters' previous faunal analysis conducted on a portion of the site's assemblage. This inquiry

will focus on comparing the areas within the interior plaza to provide insight into dietary practices and to see if socio-economic status use of certain areas can be inferred. This study will incorporate the use of their hunted versus domestic resources, aquatic versus terrestrial animals, element selection, butchery practices, size class, hunting practices and the potential consumption of horses and bison.

Reents-Budet, Dorie (Museum of Fine Arts Boston)

[126]

Too Many Sherds, Not Enough Time: The Contributions of Ronald L. Bishop to Studies of Ancient Maya Ceramics

Ronald L. Bishop is among the earliest proponents and adopters of neutron activation analysis (NAA) to the study of archaeological ceramics beginning in the late 1960s. He recognized the analytical technique's potential for the study of exchange systems, ancient economies, and socio-political process. With his unique background, Bishop coupled a geo-chemist's understanding with an archaeologist's perspective of what constituted an important problem and a workable investigative direction toward a solution. Bishop realized that understanding the data patterns of compositional similarity and their potential for addressing archaeological questions required the additional perspectives of other disciplines including art history. Teaming with this paper's author, with ceramics studio and inorganic chemistry background, the collaboration has proven fruitful. This paper reviews the 30+ years' of results from the cross-disciplinary partnership united by neutron activation analysis and a desire to extract more information from the millions of potsherds littering labs and warehouses throughout the Maya region.

Rees, James (Arkansas Archeological Society)

[266]

Searching for the Smoking Drum: The Evidence for the Presence and Ceremonial Importance of Ceramic Vessel Drums in the Prehistoric Southeastern United States

Early historical accounts suggest that drums played an important role in the ceremonial life of the prehistoric Southeastern United States. However because they were made in whole or in part of ephemeral materials, drums are virtually invisible in the archaeological record. Interestingly, historical records, ethnographic information, and iconographic imagery from Spiro and other Southeastern sites all point to one particular form of ceramic vessel drum as being present in prehistoric times. This study focuses on how these drums fit into the cosmic symbolism of the Mississippian period and how they might be identified and distinguished from other similar vessel forms.

Rees, Mark [9] see Britt, Tad

Reese, Kelsey (University of Notre Dame)

[134]

Community Construction and Resilience on the Mesa Verde North Escarpment

Subsistence-based farming communities are communities of "people who depend on natural resources for their livelihood," and who typically rely on long-term, inter-generational sharing of cultural knowledge concerning ecological systems, and observations and experiences of environmental processes. Recent research on the globalized impacts of climate change reveal "profound disruptive effects at local levels" in subsistence-farming communities and their surrounding ecosystems. A community's ability to respond to climate volatility, or potential volatility, is dependent on: the physical and cultural context within which climate volatility is occurring; the scale at which it is being experienced, and; the potential strategies available to each population that can be employed to mitigate the adverse effects of a changing climate. This paper will present a case study on the ancestral Pueblo occupation of the Mesa Verde North Escarpment in southwestern Colorado from AD 600–1300. This study will provide a longitudinal lens to examine the short-term effects of climate volatility and the long-term effects of sustained climate change on subsistence-based farming communities in a high-desert environment. The results will outline the role of climate in community formation practices, periods of population resilience, and ultimately the complete depopulation of the region.

Reese, Kelsey [147] see Hill, Austin

Reese, Kelsey [149] see Jaskowski, Clay

Regnier, Amanda [107] see Hammerstedt, Scott

Regnier, Amanda [189] see Levine, Marc

Regnier, Amanda [222] see Livingood, Patrick

Reich, David [173] see Nores, Rodrigo

Reid, Amy (Center for Archaeological Studies, Texas State University), Jessica Mundt (New South and Associates), Maximilian Hall (Texas State University) and John Fulbright (Texas State University)

[187]

Pest Treatment through Partnership

As part of the mission of the Veterans Curation Program (VCP) to rehabilitate archaeological collections owned by the U.S. Army Corps of Engineers (USACE), the Satellite VCP lab at the Center for Archaeological Studies (CAS) at Texas State University recently partnered with the Archives and Research Center (ARC) at the University to administer freeze treatment of USACE collections to eradicate pests. Through these efforts CAS, ARC, and USACE staff were able to stop pest activity that was damaging

artifact labels and containers that likely would have led to loss of context throughout the collection, if allowed to persist. This serves as an example of the damage that can “quietly” occur to archaeological collections and the partnerships that can be forged to preserve the integrity of these materials. This poster provides photographs and descriptions of the pest damage, the freeze treatment process, and the rehabilitated collection.

Reid, David (University of Illinois, Chicago)

[105]

Dating a Wari D-Shaped Temple: New Radiocarbon Evidence from Pakaytambo, Arequipa, Peru

The Middle Horizon (AD 600–1000) was a time of profound social transformation in the Andes, distinguished in part by the expansion of Wari influence, peoples, and state institutions outside of the Ayacucho heartland. In this paper, I present findings of an architectural complex composed of Wari patio-groups, a D-shaped structure, and monumental platform construction at the site Pakaytambo in southern Peru (upper Majes Valley, Arequipa). Analysis of excavated material remains and AMS radiocarbon dates indicate Wari occupation occurred sometime between the late eighth and tenth centuries AD. Here I report initial findings and draw similarities to other D-shaped enclosures at Wari sites across Peru. Pakaytambo's strategic location along the valley's major prehistoric road and its placement below a possible local shrine or apu would have framed interactions with nearby populations. Consequently, Pakaytambo provides an ideal perspective on the use of ideology as state power in a frontier context.

Reid, James [156] see Whittlesey, Stephanie

Reid, LaMarise (William & Mary)

[43]

Discussant

Reid, Rachel [35] see Sun, Yufeng

Reilly, Frank (Texas State University)

[47]

From Cave Mouth to Temple Door

I suggest that at some point in the development of the Braden art style that the three dimensional flint-clay statuettes (AD 1100–1175) take the place of the earlier Braden style paintings (AD 900–1000) found in caves and rock shelters while temples (BBB Motor Site) that house the flint-clay statuettes, substitute for the caves that housed the earlier paintings. Thus the images carried by the Braden style become renditions of preternatural anthropomorphic and animal figures as well as several categories of symbols while the temples substitute for the caves that appear to be the natal point of the style.

[47]

Chair

Reilly, Frank (Texas State University)

[166]

Discussant

Reilly, Sophie (Northwestern University) and Andrew Roddick (McMaster University)

[105]

A Taste for Tubers: The Circulation of the Familiar through the Ancient Titicaca Basin

Archaeologists track the social, political, and economic dynamics of the ancient Lake Titicaca basin through the circulation of people and things. Plant things, in particular, reveal food choices, quotidian diets and special meals, and broader trade relations before and after the settling of the urban center of Tiwanaku. In this paper, we discuss paleoethnobotanical work at two settlements with Late Formative and Tiwanaku occupations. We present new evidence for lowland tubers (yuca, sweet potato, arrowroot) from the recently excavated site of Challapata in the eastern Titicaca basin and the well-known southern basin site Chiripa. We consider these non-local food findings in the context of local tubers, such as potato, oca, and ulluco. Why would Titicaca tuber growers wish to acquire lowland tubers as well? We suggest that these non-local plants were desirable because of a particular local taste for tubers and extant knowledge of tuber cooking techniques. Titicaca Basin communities chose their food (and cultivated trade relations) due to particular tastes and food familiarity, not simply for exotic flavours. We suggest the need for further attention to such choices, particularly over periods where not just social and political orders were changing, but likely larger sensory worlds associated with food choice.

Reilly, Sophie [54] see Emery, Kitty

Reinhard, Karl and Dong Hoon Shin (Seoul National University College of Medicine)

[247]

Discovery of Chinese Liver Flukes in Latrine Sediments

Parasitological analyses of five sediment samples from latrine deposits spanning the time period from about 1880 to the 1930s are presented. Two sediment samples are from a latrine used by Euro-Americans. Three sediment samples are from latrines used by

Chinese-Americans. Two of the Chinese latrines were positive for human parasites. The human parasites encountered include the human whipworm (*Trichuris trichiura*), the giant intestinal roundworm (*Ascaris lumbricoides*, c.f.), and the Chinese liver fluke (*Clonorchis sinensis*). The find of the liver fluke is especially important. This parasite cannot complete its life cycle outside of its endemic range in Asia because suitable intermediate hosts are not present in the American continents. Its presence signals that at least some of the Chinese-Americans who used the latrines were immigrants who were infected in Asia and then sustained infections while in the Americas.

Reinhart, David [175] see Bandy, Matthew

Reis, Yevgenia [173] see Kim, Alexander

Reitze, William (University of Arizona)
[68]

Lucy: The Unknown New Mexico Folsom Site

The archaeological history of the Lucy Site (LA4974) has been riddled with questions since its original discovery and excavation in the mid-1950s. The original excavations were conducted to recover materials attributed to the Sandia cultural complex and corroborate the antiquity of the original work conducted at Sandia Cave. While significant questions of the legitimacy of the Sandia concept exist, the Lucy site documents an extensive surface assemblage; including two discreet Folsom loci. This paper presents a reinterpretation of the Folsom materials from Lucy focusing on the spatial distribution of artifacts, geoarchaeology, and lithic raw materials. Better understanding of Lucy allows a broader perspective on Paleoindian occupation in Central New Mexico and more broadly, occupation in the Southwest and Southern Plains.

Renaud, Jared (University of Arizona)
[186]

Utilizing Site Condition Assessment Data for Resource Management Planning at Organ Pipe Cactus National Monument

Due to limitations in funding, staff, and time, many public-sector land management agencies have difficulties upholding their archaeological site management responsibilities. Organ Pipe Cactus National Monument (ORPI) in southwestern Arizona is one such example. In many situations, the rate at which archaeological sites deteriorate, how often impacts occur, and the most frequent site disturbances are not always observed on a scale enabling long-term land management planning for cultural resources. This study utilizes data gathered from past ORPI site condition assessment work to analyze impacts from a non-random sampling of pre-contact archaeological sites located throughout the Monument. The author will then use this data to determine the most historically impactful documented sources of site impacts, more recent trends in site disturbances, and whether any correlations can be made with impact types and recent environmental trends at ORPI. This study will incorporate approaches from past condition assessment studies on both public and private lands in an effort to develop effective management recommendations fitting for the public agency of this project's focus.

Renson, Virginie (University of Missouri)
[237]

Applying Lead and Strontium Isotopes in Pottery Provenance

Isotopic geochemistry has been applied in archaeological sciences to identify circulation of objects as well as human mobility for decades. With the development of multi collector-inductively coupled plasma-mass spectrometers, this approach has become more widespread with lead and strontium representing two of the most commonly applied isotopic systems. For the identification of source and circulation of ceramics, however, the main analytical techniques continue to be elemental chemistry and petrography. Here, we examine how isotopic geochemistry can contribute to our understanding of ancient ceramic provenance and exchange. Examples are drawn from studies of Late Bronze Age and Late Roman-Late Hellenistic ceramics from Eastern Mediterranean contexts and Early Formative ceramics from multiple sites in Mexico. These examples illustrate how lead and strontium isotopes allow determining production centers of material unassigned by elemental chemistry, how isotopic analyses contribute to the identification of local objects and imports, and how they allow relating ceramics to their raw materials and identifying mixing patterns.

Renson, Virginie [237] see Peacock, Evan

Reuther, Joshua, Sam Coffman (University of Alaska Museum of the North), Charles Holmes (University of Alaska), Ben Potter (University of Alaska) and Jeffrey Rasic (National Park Service)
[82]

Prehistoric Obsidian and Rhyolite Acquisition and Movement across the Middle Tanana Basin in Interior Alaska

The middle Tanana valley has a prehistoric record dating over 14,000 years with several stratified, multi-component sites with lithic artifact assemblages that contain obsidian and rhyolite. A multitude of studies have shown that obsidian and rhyolite artifact chemistries in Alaska and western Canada are useful to track the human movement of these materials across landscapes, either by direct raw material acquisition at a source to a site, or by exchange. We have analyzed over 5000 geological obsidian and rhyolite source samples and artifacts from Alaska and neighboring regions of Canada (Yukon and British Columbia), with >1600 of these artifacts from middle Tanana valley sites, using x-ray fluorescence, neutron activation analysis, and inductively coupled plasma mass spectrometry. Middle Tanana Valley sites like Broken Mammoth, Swan Point, Upward Sun River, and others provide intersite and intrasite comparisons and diachronic perspectives to differences in toolstone procurement and movement are apparent from the earliest Paleoindian populations >13,000 years ago to recent Subarctic foragers.

[82]

Chair

Reuther, Joshua [82] see Doering, Briana

Reuther, Joshua [202] see Sattler, Robert

Reyes, Omar (CEHA, Instituto de la Patagonia, UMAG), Carolina Belmar (Universidad de Chile), Augusto Tessone (INGEIS-CONICET), Manuel San Román (CEHA, Instituto de la Patagonia, UMAG) and Flavia Morello Repetto (CEHA, Instituto de la Patagonia, UMAG)

[61]

What Is Cooking in the Pots of the Chiloe Archipelago? A Multiproxy Approach to Determine the Presence of Horticultural Groups
Marine hunter-gatherers groups have occupied the northern-Patagonian channels since ~6000 yrs cal BP. Isotopic analyses of human remains plus lithic and faunal studies show that they have a strong marine diet with small variations toward the late Holocene. In the last 300 years, post-European contact, there is a significant change in diet related to contact with other groups that carry pottery and domesticated species, that would have occurred ~ 1000 years cal BP, but with no direct archaeological evidence that refers to this important change in the cultural trajectories. To evaluate possible changes in the consumption of wild and domesticated species and marine resources due to acquisition of this new technology, we carried out residue analysis of the pottery sherds, to see what old and new ingredients are being prepared in the ceramic vessels. The sample comes from sites of the Chiloe archipelago, ascribed to the prehispanic traditions, some related to the late ceramic period and others to the historical period. We shall compare these results with stable isotope studies and faunal, botanical and lithic assemblages of sites prior to this moment of contact to understand changes and social interactions between different social and cultural systems. FONDECYT 1170726.

Reyes, Omar [177] see San Román, Manuel

Reyes Parroquin, Maria

[227]

Large Symbols in Small Places: Depictions of El Tajín's South Ball Court in Non-Monumental Sculpture of the Gulf Coast
El Tajín's South Ball Court has one of the most interesting reliefs in Mesoamerica, depicting the ball game ritual, and has been widely studied in recent years. It would be expected, given the importance of the city, to find similar iconographic elements in other parts of the Gulf Coast. It is rare, nevertheless, to come across such representations in non-monumental sculpture, especially figurines. Monumental sculpture was associated with the elite, the small sculpture was associated with the people. So why is it that we can find some of the iconographic elements depicted on the South Ball Court of El Tajín in non-monumental representations of south-central Veracruz? In this paper, we will discuss the recurrences of some symbols found in the monumental relief of the South Ball Court, their main iconographic interpretations and their presence in other small-scale traditions of Veracruz in order to shed some light to the dynamics of the Gulf Coast at the end of the Classic Period.

Rezes, Emily [268] see Muros, Vanessa

Rhode, David [170] see Des Lauriers, Matthew

Rice, Sarah, D. Craig Young (Far Western Anthropological Research Group Inc.) and Daron Duke (Far Western Anthropological Research Group Inc.)

[8]

A Model for Site Formation in Dune Settings: A Case from Knolls Dunes, Western Utah
Knolls Dunes is one of the largest coalesced dune fields in the Great Basin and a prominent landform in the Bonneville Basin of western Utah. Changes in dune landscapes over time, as eolian processes deposit and erode landforms, contributed to archaeological site formation within and around these dunes in ways fundamental to dune environments. To illustrate this, we present a simplified time-series schematic representative of major dune-building episodes at Knolls Dunes. The model is a simplified expression of cyclical and continuous depositional and erosional processes and how these processes yield sites of varying levels of integrity. We present six temporal phases of site formation from Late Pleistocene to modern times, and we associate the intervals with observed landforms and sedimentary units to illustrate that the sequence can operate at almost any timescale.

Rich, Michelle (Dallas Museum of Art, Art of the Americas)

[109]

Discussant

Rich, Michelle (Dallas Museum of Art, Art of the Americas), Matthew Robb (Fowler Museum, UCLA) and David Freidel (Washington University, St. Louis)

[166]

Jade Faces: Heirlooms and Emulations in Olmec and Maya Art

From the colossal heads of the Olmec to the severed head of the Maya Maize God in the Popol Vuh, the head and face have been body parts of singular importance in Mesoamerican art and thought. If the human body is an axis mundi, the head and face give that axis a physical manifestation of individuality. A nexus of thought and emotion, the head and face provide the bodily armature for

personal identification and royal regalia such as headdresses and diadem jewels. In this presentation, we follow in the rich tradition of Kent Reilly's examinations of Olmec iconography that link site planning, objects from archaeological contexts, and his bold conjectures connecting these into coherent models of royal power and performance. We draw on some of his myriad observations in order to construct a new narrative weaving together cosmograms, metaphorical links between heads and seeds, and the use of heirloom objects in ancient Mesoamerica.

Richards, John (University of Wisconsin, Milwaukee), Sean McConnel (University of Wisconsin, Milwaukee) and Ned Farley (Wisconsin Lutheran College)

[78]

Geophysical Survey at the Aztalan Site: Lessons from Two Near-Surface Remote Sensing Surveys

In 2017, the Aztalan site (47JE0001) in southeast Wisconsin was surveyed using a fluxgate gradiometer. Aztalan is a Late Woodland/Mississippian mound-and-village center related to the late Lohmann and Stirling phases of the American Bottom and was occupied from the late tenth to the mid-thirteenth century. The geomagnetic survey collected subsurface data from 26.7 acres of the site including most of the area inside the 22-acre, palisaded portion of the settlement. Results identified 367 anomalies that represent both recent and pre-contact disturbances including pits, structures, hearths and palisade lines. In 2019, a less extensive GPR survey collected data from approximately 2.8 acres coincident with portions of the geomagnetic coverage. The survey targeted areas adjacent to the Southwest Mound and portions of the residential sector of the site. Coverage was obtained also of an area centered around an asphalt parking lot that was magnetically noisy due to the presence of iron rebar. The UWM Archaeological Field School assisted the GPR surveyors and chose two anomalies identified by both surveys to ground-truth. Results suggest that: (1) the two methods can return complimentary information; and (2) a large-scale, systematic testing program will be necessary to confidently interpret results of either geophysical dataset.

Richards, Nathan [221] see Bush, Dominic

Richards, Patricia (University of Wisconsin, Milwaukee)

[167]

Discussant

Richards-Rissetto, Heather (University of Nebraska, Lincoln), Kristy Primeau (SUNY Albany) and David (SUNY Buffalo)

[25]

Incorporating Vegetation Reconstruction in Computational Landscape Archaeoacoustics: An Ancient Maya Case Study

The Ancient Maya perceived settlements as *kahkab*, or "populated earth"; that is, urban agrarian places where residences intermixed with gardens and orchards. In previous work, we simulated the late eighth and early ninth-century landscape of the ancient Maya city of Copán to investigate multi-sensory experience. Building on this work, we now refine the landscape reconstruction to explore the impacts of vegetation on what was seen and heard through the incorporation of paleoenvironmental data, ethnobotanical data, and remote sensing. Using the Variable Cover Type Soundshed Analysis tool in the Archaeoacoustics GIS toolbox, we perform computational analysis to generate soundsheds and a digital surface model to generate viewsheds for several of Copán's valley stelae, exploring how vegetation may have impacted the experience of rituals conducted at these locations.

Richards-Rissetto, Heather (University of Nebraska-Lincoln)

[155]

Discussant

Richissin, Caleigh

[178]

Investigating a Classic Maya Market at Say Kah, Belize

The intended goal of research carried out in 2019 at Say Kah, Belize was to identify and calculate the statistical significance of geochemical traces of particular elements including but not limited to: zinc, phosphorus, and iron at the sites 43 x 33 m plaza. This research is the first phase in understanding the use of Say Kah's paved plaza as a potential marketplace during the Classic Period (ca. 250–900). Research on Classic Maya markets has been on the rise although difficult in the past, due to the level of perishability and consumption of subsistence goods and the removal of goods from a physical market post-acquisition. More recently, new developments in soil geochemistry have made material evidence of marketplaces more visible and accessible. Such methods were employed during the 2019 season at Say Kah in order to identify specific activities which have occurred repeatedly and help to indicate patterns of behavior in areas of food preparation, consumption, trade, and waste. In a larger sense, the analysis carried out in Say Kah's central plaza also aids in the identification of the types of relationships between Say Kah and other major sites in the region that would have been necessary to sustain an active marketplace.

Richter, Jürgen [162] see Chu, Wei

Richter, Kim (Getty Research Institute)

[144]

Discussant

Richter, Kim (Getty Research Institute)**[191]***The "Tamtoc Venus": An Early Huastec Sculpture and Its Connections to Gulf Coast Sculptural Traditions*

Although the Huasteca belongs to the Mesoamerican culture area and the Gulf Coast region, some scholars have asserted that its culture, emblemized by its sculptural tradition, was isolated. The examination of Huastec stone sculptures from different periods reveals not only its links to other artistic traditions in Mesoamerica but significantly also to other Gulf Coast sculptural traditions. Another misconception is that the sculptural tradition flourished during the Postclassic period. The discovery of sculptures from earlier periods at the site of Tamtoc in the heart of the Huasteca counters this misconception. This presentation will analyze the earliest Huastec sculpture known to-date: the fragmented scarified female sculpture discovered in an offering below Monument 32 at Tamtoc, sometimes called "Tamtoc Venus" for its voluptuous, naturalistic body. I will propose an estimated period of manufacture based on artistic criteria and place the sculpture in its art-historical context, relating it both to local traditions of clay figurines and broader regional traditions of Gulf Coast sculpture.

Richter, Kim (Getty Research Institute)**[227]***Chair***Rick, Torben (Smithsonian Institution)****[100]***Discussant*

Rick, Torben [129] see Wellman, Hannah

Ricker, Matthew [130] see Marken, Damien

Ricketts, Macy (University of Wyoming), Naomi Ward (University of Wyoming), Todd Surovell (University of Wyoming) and Madeline Mackie (University of Wyoming)**[244]***Microbial Community Structure within Stratified Soils at the La Prele Mammoth Site*

Microbiology has only recently been used as an emerging tool for analysis of archaeological sites. Predominantly, bacteria and fungi within these sites have been used in medical applications. However, recent technological advancements have allowed researchers to use both living and ancient microbes as tools to potentially understand past climate and human movement. These ecological studies include an experimental approach known as the Trophic Group Method that assumes the physiological properties of present-day bacteria buried in paleosols can serve as indicators of climate aridity. First systematically tested on soil samples from the Hell Gap Paleoindian campsite (Grund et al., 2014; Viable paleosol microorganisms, paleoclimatic reconstruction, and relative dating in archaeology: a test case from Hell Gap, Wyoming, USA: *J. Archaeological Science* 46: 217–228), this method's validity is being further examined by using a holistic approach investigating DNA from living and recently dead or ancient bacteria, and a variety of soil properties within a test unit at the La Prele Mammoth kill site near Douglas, Wyoming. Using ecological theory as a foundation, we analyzed soil samples taken from a sediment profile at La Prele in order to understand the driving factors behind community formation at different stratigraphic positions.

Ridge, William (University of Illinois, Chicago)**[34]***Where Did You Go? Possible Depopulation during the Copper Age in Eastern Hungary*

The Copper Age in eastern Hungary is characterized by small and ephemeral settlements and the movement of new peoples into the region. By the Middle Copper Age (4000–3500 BCE) the number of sites on the landscape had plummeted and the available data on settlements from this period is extremely limited. This may be due to a process of regional depopulation that began shortly after the abandonment of tells and other large centralized settlements at the end of the Neolithic. Such a depopulation would be especially interesting given the novel culture groups that appear in the region during the succeeding Late Copper Age (i.e., kurgan, Boleráz/Baden). Using the robust regional dataset of the Magyarország Régészeti Topográfiája (Archaeological Topography of Hungary) and the fieldwork I have conducted over the last two years, I examine to what extent the dramatic decrease in the number of sites during the Middle Copper Age is attributable to a decrease in population. I also compare the results of the Körös River Basin in Hungary with other regions throughout Eastern Europe to see if the processes experienced here are part of larger-scale trends affecting the macro-region during the fourth millennium BCE.

Ridge, William [199] see Gyucha, Attila

Riebe, Danielle (Field Museum of Natural History)**[199]***The Complexities of Settlement Complexes: Reassessing Late Neolithic Settlement Organization on the Great Hungarian Plain*

When it comes to studying settlement patterns, scale is essential for answering questions related to internal developments. In the case of Late Neolithic (5000–4500 BCE) research on the Great Hungarian Plain, what we are learning is that bigger is better when it comes to scale. The Prehistoric Interactions on the Plain Project (PIPP) has set out to better contextualize the dynamic processes that resulted in cultural variation during the Late Neolithic by modeling multi-scalar interactions between two archaeological units:

Herpály and Tisza. As part of an NSF funded project, intensive investigations began at the Herpály site, Csökmő-Káposztás-domb in the summer of 2019. Previously, it was assumed that Herpály sites consisted of a tell with a possible small external flat settlement. However, little research has been conducted to support this conclusion. Large-scale geophysical prospection conducted at Csökmő-Káposztás-domb suggests that tell-centered Herpály settlement complexes are much larger and more amalgamated than previously suspected. This paper presents data from PIPP's 2019 field season and compares the magnetometric results with other Herpály and Tisza sites to draw new conclusions about Late Neolithic settlement patterns and socio-cultural variability on the Great Hungarian Plain.

Riebe, Danielle [199] see Gyucha, Attila

Riehl, Simone [36] see Oechsner, Amy

Riehm, Grace (University of North Carolina, Chapel Hill)

[78]

Vessel Forms in the Late Prehistoric and Early Historic Natchez Bluffs

While we have a general understanding of the pottery that Plaquemine and early Natchez peoples (approximately AD 1200–1730) made in the Natchez Bluffs and surrounding region, our understandings are based on types and varieties defined between the 1950s and 1960s and refined through the 1980s. These types are primarily based on style, paste, and generalized shape categories, with little consideration of functional classes and the variation within and between styles. Here I examine drawings and photographs of whole and partial Plaquemine and early historic Natchez ceramic vessels from various sites in the Natchez Bluffs. Using visual and quantitative analyses, this research develops a more standardized way of discussing Plaquemine and early historic Natchez vessel shape and function for comparison between sites and across the broader Lower Mississippi River Valley through time.

Riemersma, Gert [147] see Varien, Mark

Rieth, Timothy (IARII)

[24]

Discussant

Rieth, Timothy (IARII) and Ethan Cochrane (University of Auckland)

[100]

Explaining Initial Settlement of the Mariana Islands

Based on archaeological, biological, linguistic, and voyaging simulation data, ancestral Mariana Islanders likely set sail from somewhere to the west or southwest, with the Philippines, Sulawesi, and the Maluku Islands as the most likely candidates. How do we explain the colonization of the Mariana archipelago? This requires developing theoretically informed models that offer predictions for the archaeological record and descriptions of the data that are necessary for falsification. These should address proximate and ultimate processes—events that caused or facilitated migration (proximate) and evolutionary explanations based on selection or other sorting mechanisms (ultimate). Instead of models, narrative descriptions have been offered that rely on aspects of the archaeological record, linguistics, common sense, and ethnographic analogy. The dominant narrative situates the settlement of the Marianas as part of a Neolithic expansion that rolled across ISEA, into Near Oceania, and ultimately into Remote Oceania. An opposing view states that the initial colonists were not permanent residents but rather were itinerant marine forager/traders analogous to historical and present-day “sea nomads” that traverse parts of ISEA. Neither is satisfying as an explanatory model. Here we consider each proposition and evolutionary explanations for human population movements in relation to the archaeological record and archaeological expectations.

Rieth, Timothy [24] see DiNapoli, Robert

Rieth, Timothy [135] see Krus, Anthony

Rieth, Timothy [262] see Morrison, Alex

Riethmuller, Douglas (Binghamton University)

[203]

Cultural Intersections in the Late Woodland Northeast: pXRF Analysis of Ceramic Paste at the Thomas/Luckey Site, New York

The Late Woodland is a period that represents significant cultural changes in the northeastern U.S. The Thomas/Luckey site, in the Chemung Valley of New York, has produced ceramics representing different regional groups. Ceramic types include Kelso Corded, Oak Hill, and a non-local component of Shenks Ferry. Thomas/Luckey was occupied from the thirteenth to the fifteenth century, and two longhouses represent windows into household level patterning during the fourteenth and fifteenth centuries. Shenks Ferry pottery represents a non-local group, and its presence indicates trade of objects, migration of people, or a permutation of the two. Building from Rieth, Knapp, Miroff, and others, this paper assesses whether non-local ceramics represent migration, trade, or the adoption of non-local decorations. Sherds were analyzed via pXRF. While typologies are based on visual attributes (iconography), pXRF looks at the elemental composition of ceramics. Decoration can be copied, but paste cannot and this can more accurately illustrate the origin of the vessels. As cultural groups are not static entities, changes are indicative of internal development or out-group interaction. Results will add new depth to conceptions of group movement and how identity can be constructed within Late Woodland villages.

Rigaud, Jean-Philippe [36] see Franklin, Lauren

Riggs, Erin (SUNY Binghamton)
[204]

Refugees of the British Empire: Partition Migrant Homes in Delhi after the 1947 Partition

With Independence, India inherited Delhi; a capital city with built landscapes shaped by pasts incongruous with the ideals of an Independent India. The legacies of colonial inequality were apparent everywhere in the city—from its monumental spaces to its residential neighborhoods. The government sought to transform these spaces in order to make room for a modernizing, upwardly mobile, populous; many of whom were dispossessed Partition refugees without homes. In this paper, I focus on how refugee resettlement impacted the homescapes of pre-Partition Delhi and gave rise new material forms. My findings are the result of a survey of cityscapes and individual homes in Delhi and interviews with 98 Partition refugee families.

Riley, Tim (Prehistoric Museum @ USU Eastern)
[89]

Moderator

Riley, Tim (Prehistoric Museum @ USU Eastern) and Katharine Corneli (Utah State University Eastern Prehistoric Museum)
[258]

Animal, Vegetable, Mineral? The Characterization of "Resins" Binding Composite Artifacts from the Northern Colorado Plateau

Like many museums across the American West, the Utah State University Eastern Prehistoric Museum houses a collection containing well-preserved perishable objects. Many of these artifacts incorporate organic binders, such as hafted arrows and pitched containers. Yet scant attention has been given in the literature to the use of resins as the glue that held life together. Studies across the Southwest and beyond show a surprising diversity of binders, including insect lac and asphaltum as well as plant exudates, were used on artifacts. This presentation highlights work done to characterize the sources of these binders and to recover data which might reflect artifact use. Borne from an attempt to evaluate the presence of modern replicas or pastiches within private collections, this study involved plant harvesting and artifact replication experiments, visual and microchemical tests, microscopic identification of trapped components, and molecular identification. A secondary component of this study was the recovery of use-wear residue accumulated in the resinous matrix. The microscopic materials trapped in the patch of a ceramic cooking pot or hafted scraper can provide valuable insight into artifacts with limited provenience, shining new light on old collections.

Ringberg, Jennifer (California State University, Stanislaus)
[106]

Meeting in the Middle: Cultural Dynamics of Early Intermediate Period Highland Colonies in the Middle Moche Valley, Peru

Residents of the Early Intermediate period (EIP) settlement of Cerro León (ca. CE 1–300) in the middle Moche valley maintained a highland identity through several cultural practices, including culinary traditions and feasting, crafting, and ancestor worship. They lived in close proximity to, interacted economically, and likely formed marriage alliances with members of coastal (Gallinazo-Virú) culture groups. Yet, at Cerro León, there is very little evidence that members of this multi-generational, highland-dominated colony actively engaged in stylistic integration or the adoption of elements of the material culture styles of the other. Instead, the shared focus of interacting EIP highland and coastal groups appears to have been the intensification of maize. In this presentation, I address continuity and change regarding the mobility of people, goods, and ideas in the middle Moche valley in the period leading up to Moche political consolidation and expansion. I also examine how this case study informs us about the shifting alliances and sociopolitical interactions among highland and coastal groups during the Middle horizon. Although the occupation of Cerro León precedes the time period that is the focus of this symposium (C.E. 500–950), it provides essential context for events that reshaped northern Peru in the centuries to come.

Ringle, William (Davidson College), Tomás Gallareta Negrón (CY-INAH), Rossana May Ciau (CIESAS) and Ken Seligson (California State University, Dominguez Hill)
[230]

The Highs and Lows of Working with Puuc Lidar Data

The broken topography of the uplifted cone karst landscape of the Puuc region presented several challenges to its inhabitants, including water storage, procurement of construction material, efficient movement from place to place, and perhaps effective protection from potential attack. This paper presents preliminary analyses of these factors within a 237.1 km² lidar dataset collected by NCALM in 2017 and then selectively surveyed by the Bolonchen Regional Archaeological Project (BRAP). We discuss methods for identifying and quantifying landscape concavities, especially chultuns and quarry pits, and convexities, especially optimal places for surveillance and intersite visual communication, such as fires or smoke signals, or for monitoring movement between centers. These are presented in relation to our ongoing study of prehispanic settlement in the region, at sites such as Kom, Xcanbul, and Muluchtzeke.

Ringstaff, Christopher (Texas Department of Transportation)
[194]

Prehistoric Punch Technology in Texas: Experimentation, Observations, and Analytical Implications

A recent review of collections and literature from Texas prehistoric sites reveals antler artifacts variously referred to as punches, drifts, and antler cylinders. These artifacts are often interpreted as tools for indirect percussion knapping. This paper reports the results of flintknapping experiments conducted with replicas of these artifacts for biface manufacture using the indirect percussion

technique. The results are compared to direct percussion biface experiments examining both bifaces and debitage. This study reviews the spatial and temporal context of these antler artifacts across Texas as well as their form and function. A summary of the experimental results proposes possible use techniques, presents use-wear comparisons of the archeological specimens and replicas, and provides initial qualitative and quantitative analyses. The conclusion presents preliminary interpretations of these antler artifacts and provides a basis for future research.

Ringstaff, Christopher [194] see Parker, Adam

Rios Allier, Jorge (Indiana University)

[231]

Current Perspectives on the Mexican Archaeological Heritage Management: Some Considerations of the Present Models

The present work shows the different perspectives of management that have accompanied the administration of the Mexican archaeological heritage. Mexico has many UNESCO World Heritage sites, archaeological sites and museums, where various financial mechanisms have been chosen for the operation, management, research and dissemination of cultural property. Also, this study aims to show the findings in the literature about the use of financial mechanisms for the implementation of cultural heritage management in Mexico, their definition according to their legal framework, the possible dependence on changes in terms of political alignment or their socioeconomic context.

Risner, Lacy [227] see Venter, Marcie

Rissolo, Dominique (University of California, San Diego)

[238]

An Overview and Synthesis of Paleocoastal Research on the Yucatán Peninsula

The broad carbonate platform and shallow continental shelf of the Yucatán Peninsula supported the rise of the northern lowland Maya and the dispersal of Paleoamerican peoples thousands of years earlier. Exploration—particularly in the region's now-submerged cave systems—has revealed the remains of the Yucatán's earliest human inhabitants as well as diverse and relatively well preserved faunal and botanical assemblages. Additionally, growing interest in Maya maritime trade and interaction has necessitated a more holistic understanding of the interrelationships between humans and coastal processes, particularly in zones of low topographic relief. Over the past two decades, interdisciplinary research programs have more intensively focused on Late Pleistocene through Late Holocene sea-level rise—and its implications—via a range of methodologies and proxies. Efforts have involved the recovery and analysis of cave and shallow marine sediment cores, speleothems, and sub-bottom sonar data in addition to detailed mapping and in situ geological and paleontological sampling. The resulting reconstructions of paleoclimate, paleoecology, and overall paleocoastal geomorphology have proven integral to ongoing archaeological investigations on the Yucatán Peninsula.

Rissolo, Dominique [33] see Glover, Jeffrey

Ritchison, Brandon (University of Illinois Urbana-Champaign) and Brandon Ritchison

[63]

Constructing Communities: Continuity and Change in Community Organization on the Georgia Coast, 2250 BC–AD 1650.

The Georgia Coast, along with much of the South Atlantic and Gulf Coasts of the modern United States, was home to some of the earliest sedentary villages in North America (ca. 2250–1000 BC), materialized in monumental-scale rings of refuse. This region was also the location of some of the first sustained contact between American Indians and Europeans in what is now the mainland of the modern United States (beginning ca. AD 1527). However, the focus on these two periods has led to a poor understanding of community organization in the intervening millennia. Recognizing the incomplete understanding of long-term patterns of community organization resulting from the field methods and research foci most commonly employed on the Georgia Coast, many recent archaeological projects on the Georgia Bight have adopted explicitly holistic and systematic approaches to data collection. On this poster, I present the findings from one of these projects, the systematic survey of Kenan Field (9MC67), a multicomponent site. I highlight the results relating to the demography and community organization of relatively understudied periods in the region, including the Terminal Archaic, Woodland, and Mississippian.

Ritchison, Brandon [63] see Ritchison, Brandon

Ritter, Alexandra (Western Washington University), Paloma Cuello del Pozo (Texas A&M University) and Jose Peña (University of South Florida)

[242]

Preliminary Study of Dental Health among Coastal Population at the Site of the Santo Domingo Cemetery in Huarmey, Peru

Recent archaeological excavations at the prehispanic cemetery of Santo Domingo in Huarmey, Peru revealed a looted assemblage associated with a prehispanic settlement connected to the presence of the Casma culture. The cemetery was likely utilized during the Late Intermediate Period (1000–1400 CE). In a preliminary attempt, the juvenile and adult mandibles and maxillae of 13 individuals were examined to hypothesize dietary and cultural practices exercised by this population. Common pathologies observed were alveolar resorption, severe crown wear, root caries on the buccal side, and pit caries on the occlusal side, as well as alveolar abscesses. Anomalies such as agenesis of the second premolar and the third molar were also recorded. Given the small sample size, statistically significant claims regarding lifestyle and dietary habits cannot be made without further research. However, it is hypothesized that some of the dental markers observed are related to the practice of coca chewing, along with the effects of specific

dietary habits generated from the population's coastal and agricultural resources. For future examination, the protocol outlined by Indriati and Buikstra (2001) will be applied as a well-established method to detect coca-chewers of coastal Peru.

Rivas, Alexander (Washington University, St. Louis)

[151]

Community Archaeology at Nueve Cerros

The Salinas de los Nueve Cerros archaeology project, located in Alta Verapaz, Guatemala, has had the challenge and opportunity for combining the goals of scientific archaeological research while promoting community development. This includes diversifying the local economy and improving access to health care and clean water. While community development is often relegated to an afterthought for most international field research projects, the Nueve Cerros project makes it a key component of the project. In fact, much of the scientific research would not have been carried out without focusing on the development goals first. In this paper, I share my experiences conducting community archaeology, in which the local Q'eqchi' communities play a crucial role in selecting excavation locations, methodologies conducted, and timeline of fieldwork. Many of these Q'eqchi' communities have a violent and hostile history, in which the investigations of their land for cultural heritage is not trusted, nor seen as an invaluable endeavor. This dissent can be seen in many Latin American communities. I argue that when conducting international field research, a program for community development is essential for decolonizing science, making the research a long-term benefit for the communities outside of just their cultural heritage.

Rivera, Antonieta (Simon Fraser University)

[269]

Finding the Common Thread: The Slightly Different Archaeoastronomical Orientations of Tenochtitlan, Tlatelolco, and Tenayuca

The slightly different orientations of three Aztec sites—Tenochtitlan, Tlatelolco, and Tenayuca—have been noted in multiple archaeoastronomical analyses. Multiple theories have been offered to explain these orientations. Through the utilization of an interdisciplinary approach—that utilized ethnohistoric and archaeological sources and examined these sites through a methodology integrated 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—this research demonstrated that these orientations were intended to re-create on the sacred landscape the same mythical event: the birth of Huitzilopochtli.

Rivera, Jordi [174] see Sutter, Richard

Rivera, Michael [37] see Nash, Brendan

Rivera Infante, Arturo

[242]

Lithic Artifact Diversity in the Lomas of the Middle Sama Valley, Tacna, Peru, during the Prehispanic Period

Andean lithic studies consider coastal and highlands assemblages as discrete and not sharing many characteristics. The lomas of the south Andean Peruvian piedmont form a seasonal transitory environment that reflects the mobility of hunters, pastoralists, and animals between coast and highlands over the course of the prehispanic period. The research presented here is a longitudinal study conducted in the middle Sama Valley, Tacna, Peru (400–650 masl) that highlights the variability of the local lithic assemblage from the Archaic Period (8000–3000 BC) to the Late Horizon (AD 1400–1532). The most frequent tool types include projectile points, scrapers, knives, and drills, among others. Most of these artifacts, many of which match the coastal and highland typologies, are made from local raw materials.

Rivera Infante, Arturo [242] see Baitzel, Sarah

Rivera Prince, Jordi (University of Florida) and Gabriel Prieto (University of Florida)

[174]

A "Salinar Period" Cemetery at the José Olaya Site: Preliminary Demography of a Post-Chavín Maritime Community in the Moche Valley

Systematic bioarchaeological studies of skeletal remains in conjunction with mortuary analyses provide a unique space in which archaeologists can begin to reconstruct past populations, social dynamics, and cosmologies. Following the influence of late Initial Period Cupisnique (1200/1100–500 BC) and early Horizon Chavín (800–400 BC), north coast populations entered a period of transition. The beginning of this period, the "Salinar Period" (ca. 400 BC–100/50 BC) is poorly understood in the context of the Moche Valley in northern Peru more broadly. Three years of excavations by the Programa Arqueológico Huanchaco (PAHUAN) at the José Olaya site in Huanchaco (approximately 10 km north of modern-day Trujillo) identified three Salinar Period occupations. While human remains are associated with all occupations, the identification of a cemetery means the José Olaya site has become the largest systematically-excavated Salinar period cemetery since rescue excavations at Cerro Oreja (Moche Valley) and the Puemape site (Jequetepeque Valley). To date, many burials have been recovered from José Olaya and some preliminarily analyzed. Preliminary demographic information will be presented, with particular focus on elite burials identified thus far. Considering data derived mortuary patterns, bioprofiles, and cemetery-wide trends, this paper discusses potential theoretical implications in a post-Chavín coastal Moche Valley.

[174]

Chair

Rizzo, Adriana [258] see Edelstein, Beth

Rizzo, Florencia [143] see Scheinsohn, Vivian

Rizzolo, Alexis (University of Montana) and Meradeth Snow (University of Montana)
[244]

Nondestructive and Destructive DNA Sampling Methods for Obtaining Success Rates on Genetic Sexing of Remains

This research aims to investigate the success rates of non-destructive and destructive DNA sampling methods for the genetic sexing of remains. Methods for obtaining DNA have varied, with the most fundamental level being whether samples were partially destroyed or left intact through the DNA extraction process. While testing has been completed to look at whether or not non-destructive analyses can be successful, and generally they have worked well, the rate of success for sexing individuals genetically in a direct comparison of extraction techniques has not been completed. Samples from individuals who were sexed based on skeletal markers were blindly sampled and DNA extracted in the two methods, followed by PCR and electrophoretic comparison of the results to ID the amelogenin sexual dimorphism. Due to the known issues with this type of testing (drop-out of larger alleles, contamination, etc.), this was completed in multiple steps. The resulting findings demonstrate the comparability of both extraction methods, with neither significantly outperforming the other. Through this investigation, we can achieve a better understanding of DNA sampling methods for obtaining genetic sexing on remains.

Roa, Ian [178] see Ellis, Olivia

Robb, Matthew (Fowler Museum @ UCLA)
[84]

Discussant

Robb, Matthew [166] see Rich, Michelle

Robbins, Andrew [147] see Newell, Zachary

Robbins, Brady [148] see Bryce, Joseph

Robbins, Helen
[218]

Moderator

Robbins, Karinne [77] see Kotis, India

Roberts, James [59] see Cable, Charlotte

Roberts, Jerod (Shumla Archaeological Research & Education Center), Victoria Roberts (Shumla Archaeological Research & Education Center) and Richard McAuliffe (Shumla Archaeological Research & Education Center)
[16]

Alexandria Project Baseline Documentation of Cedar Springs Shelter

In 2019, Shumla Archaeological Research Center conducted baseline documentation of Cedar Springs Shelter as part of the Alexandria Project, a multiyear project designed to gather an extensive and research driven dataset from over 350 known rock art sites in Val Verde County. The Cedar Springs mural represents one of the most well preserved and compositionally intricate Pecos River Style rock art murals in the Lower Pecos Canyonlands. The panel spans 62 m and contains over 480 identifiable figures. While a typical rock art site may take one day to gather baseline data, Cedar Springs required seven. Data collected includes detailed site and figure descriptions, iconographic data entry into Shumla's database, 15 high-resolution Gigapanoramas, context and feature photography, and a georeferenced 3D model derived from SfM photogrammetry, GPS, and total station data. The vast and multifaceted datasets from this and other sites recorded from the project will open areas for future research including rock art distribution and directionality patterns, motif attribute studies, landscape archaeology, and conservation assessments. Importantly, we have preserved the rock art at Cedar Springs into perpetuity. This paper discusses the preliminary results from Cedar Springs as well as the methods and problems in documenting large sites.

[16]

Chair

Roberts, Jerod [16] see Roberts, Victoria

Roberts, Madison [37] see Anderson, Jennifer

Roberts, Tim (Texas Parks and Wildlife Department)**[16]***The Meeting of Two Worlds: A 10-Year Review of the "Big Bend Bold" Pictograph Style of West Texas*

Defined 10 years ago, the Big Bend Bold pictograph style of west Texas has benefited from recent site discoveries and research. While the Big Bend Bold pictograph site assemblage originally included five sites in the Big Bend region, as many as three additional sites may be attributable to the style. Though attributing pictographs to a particular style can be a subjective process, portable X-ray fluorescence may be able to identify Big Bend Bold figures based on the type of pigment used; preliminary studies by Texas A&M researchers at 41PS191, the Big Bend Bold type site, indicated that all Big Bend Bold figures were painted with manganese pigment while black pictographs attributable to other styles were all produced from carbon (charcoal) pigment. The proximity of Big Bend Bold pictograph sites to La Junta de los Rios prompted the author in 2010 to suggest Patarabueye authorship for these figures. Recent petrographic and neutron activation analyses of pottery sherds from pueblo sites in La Junta, conducted at the direction of the Center for Big Bend Studies, Sul Ross State University, and of sherds recovered from 41PS191, may tell us more specifically which pueblo was responsible for the creation of this imagery.

Roberts, Victoria (Shumla Archaeological Research & Education Center), Jerod Roberts (Shumla Archaeological Research & Education Center) and Richard McAuliffe (Shumla Archaeological Research & Education Center)**[16]***Public Outreach of the Alexandria Project*

Over 95% of Texas is private property, a situation that makes large scale archaeological surveys difficult. With a goal of recording over 300 rock art sites in a 3,150 square mile area, the Alexandria project has had to secure permission from over 60 landowners. Shumla has adopted a variety of methods for the purposes of public outreach with clear goals to build strong relationships with local landowners and site stewards while increasing general public awareness in the importance of preserving and protecting rock art sites. We utilize social media platforms like e-newsletters, blogs, Facebook, and Instagram, each filling a different niche for sharing information. E-newsletters and blogs allow for more detailed reporting on various aspects of our organization while Facebook and Instagram have become our day-to-day platforms to share quick project updates, along with a recurring post tagged #MotifMonday. All these present data collected or generated as part of our ongoing research. Additionally, we produce short reports containing photos, maps, and hyperlinks to 3D models and Gigapans that summarize and illustrate our observations, providing site stewards with tangible documents to view and share. Public access to project data builds trust in our existing relationships and fosters new relationships with landowners.

[16]*Chair*

Roberts, Victoria [16] see Roberts, Jerod

Robertson, Ian [102] see Nichols, Deborah

Robins, Morgan**[65]***A Broken History Made Whole: The Use of 3D Modeling Techniques to Piece Rock Art Back Together*

Archaeological remains are often found in pieces. While curators can reconstruct smaller items like ceramics, rock art panels present a contextual dilemma. Namely, how can we reconstruct the context of the rock art panel (its original location along with the curated fragments)? The purpose of this study is to use 3D methods to create an interactive, virtual model that repositions fragmented pieces of panels with their original rockface. My project uses fragments of panels rediscovered in 2017 that were once part of a collection of rock art panels from the northeastern part of Wyoming. The panels are located in collections at the University of Wyoming (Laramie) and at The Buffalo Bill Center of the West (Cody). I used standard photogrammetry collections methods to capture panel data. Agisoft Metashape was used to create accurate models for visualization.

Robinson, Erick (Utah State University), Scott Ortman (University of Colorado, Boulder), Grant Coffey (Crow Canyon Archaeological Center), Jacob Freeman (Utah State University) and Robert Kelly (University of Wyoming)**[26]***Energy Consumption and Population Size in the Archaeological Record: Evaluating the Relationship between Radiocarbon Date Frequencies and Prehistoric Populations*

Aggregated radiocarbon date frequencies are increasingly used as a paleodemographic proxy. However, much still needs to be understood about how directly proportional radiocarbon date frequencies are to prehistoric populations. A recent paper by Freeman et al. (2018) used contemporary data for energy consumption and population size to identify sub-linear scaling, which suggests the lack of a direct one-to-one correlation between radiocarbon dates and prehistoric population size. This paper builds on that study by comparing charcoal output in the archaeological record to other paleodemographic proxies such as pottery and settlement size. We analyze data from the Crow Canyon Archaeological Center, as these data have been obtained through similar field collection strategies over multiple decades, which serves as a control for collection bias. We test whether a sub-linear scaling relationship exists between energy consumption and population size in the archaeological record. This study has implications for the validation of scaling theory in archaeology and the use of radiocarbon time series as a paleodemographic proxy.

Robinson, Erick (Utah State University)**[217]***Discussant*

Robinson, Erick [26] see Freeman, Jacob
 Robinson, Erick [177] see Tucker, Kaley
 Robinson, Erick [183] see Wells, Joshua

Robinson, Eugenia and Ronald Bishop (Smithsonian Institution)

[237]

Provenance Studies of Ceramics from the K'iche Capital Q'umarkaj, Guatemalan Highlands

Chemistry-based provenance studies of ceramics in the Southern Maya area by Hector Neff have laid a foundation for further research on ceramics from this area of Mesoamerica. Research on a collection of ceramics from the K'iche Q'umarkaj capital housed at the Middle American Research Institute, Tulane University, provides new data for assessing the origins of ceramics from the elite center in the Guatemalan highlands. Neutron activation by Ronald Bishop of painted and slipped pottery and censers has revealed that the ceramics are locally made. Other INAA studies of domestic pottery from Late Postclassic centers in Soconusco and the Antigua Valley area find similar results. The study of some of the vessels of an elite bench cache (John W. Fox et al. 1992) shows that the rulers of the site participated in macro-regional interaction networks in Postclassic times. The INAA analysis of the remains of a "shiny" Tohil-like jar with a complex incised serpent design proves that the vessel is from the Gulf Coast. According to John Pohl, a Mixteca-Puebla human effigy vessel, is certainly from the Oaxaca area and reported Tohil Plumbates jars of the rain god Tlaloc, based on Neff's studies, derive from the Soconusco area.

Robinson, Eugenia [60] see Garnica, Marlen

Robinson, Francis (Vermont State Archaeologist) and Scott Dillon (Vermont Division for Historic Preservation)

[190]

Public Archaeology as Public Data: Sharing Data and Research in a Regulatory Environment

Most of the archaeological excavations and research in New England are done within the parameters of Cultural Resource Management (CRM) projects. These studies are critically important, and the reports and other data generated from them often represent incredible methodological and analytical achievements. Their restricted dissemination (by statute or habit) however, has limited their impact on current scholarship. The authors will present initiatives undertaken by the Vermont Division for Historic Preservation to share some of these data while still maintaining protections for archaeological sites and landowner concerns. We will also suggest avenues that other consulting and regulatory entities can undertake to share their data more widely.

Robinson, Mark (University of Exeter), José Iriarte (University of Exeter), Gaspar Morcote Ríos (National University of Colombia) and Javier Aceituno (University of Antioquia)

[198]

The Younger Dryas and the Colonization of the Amazon

New archaeological data from Serranía de la Lindosa, Colombia, suggest climatic impacts on resources drove early human colonization of the Amazon forest during the Younger Dryas. At the end of the Pleistocene, humans entered South America and colonized the Bogotá plateau as temperatures rose and precipitation increased. The return to glacial conditions during the Younger Dryas stressed high-altitude resources and drove the tree line down 300–600 m. This period coincides with the first evidence of human colonization of the lowland forest-savanna ecotone, as revealed by multiple new contexts dating to ca. 12.5 kya in the rock shelters of Serranía de la Lindosa. The rock shelters show evidence of sustained and continued occupation and are accompanied by extensive rock art, which includes depictions of plants, animals, hand prints, geometric designs and now extinct megafauna. Archaeobotanical data reveal an increasing reliance on plant resources, many of which later become Amazonian hyperdominants. Integrated archaeological, archaeobotanical, climatic, and paleoecological data indicate that climatic change during the Pleistocene-Holocene transition impacted resources, causing a "push" from the Andean Plateau, and a "pull" to lowland forests, establishing the early human colonization of the Amazon.

Robles García, Nelly (Instituto Nacional de Antropología e Historia)

[145]

Avances en las investigaciones del sitio Patrimonio Mundial de Monte Albán-Atzompa

Los desastres naturales y antrópicos como los sismos, lluvias e incendios que se presentan constantemente en la zona arqueológica de Monte Albán-Atzompa nos permiten aventajar en el estudio de las estructuras y su distribución espacial. Un resultado de los recientes sismos de 2017 sobre este sitio han sido los estudios arqueológicos de diferentes áreas que colapsaron durante el siniestro. Los constantes incendios en el polígono protegido nos dan la oportunidad de realizar análisis de las áreas dañadas, mientras que las excesivas lluvias nos permiten visualizar el comportamiento de los sistemas constructivos y los desagües en las áreas públicas y residencias del sitio. De esta manera y con el apoyo de tecnologías se avanza en la comprensión de aspectos del sitio que habían sido poco estudiados.

[145]

Chair

Robles García, Nelly [145] see Frykholm, Soren
 Robles García, Nelly [145] see García, Dante

Rocha, Bruna (UFOPA, Brazil), Vinicius Honorato (Universidade Federal do Oeste do Pará, Brazil), Márcio Amaral (Instituto Mamirauá), William Balée and Lana Guimarães Melo

[161]

The Pristine Myth and Its Consequences for Amazonian Forest Peoples: An Example from the Upper Iriri

Located in the Xingu-Tapajós interfluvium, the Terra do Meio is currently made up of a mosaic of protected areas and indigenous reserves. This case study considers the relationship between the riverine traditional communities (who call themselves beiradeiros) of the upper Iriri River and the Brazilian state, from the time when the area they inhabit since the late nineteenth century was decreed an Ecological Station—a modality of conservation unit that prohibits human occupation. Based on the “pristine myth”—the notion that the environment should be totally protected/preserved—these beiradeiros have been pressured, at times violently, to leave the area. This paper will present recently acquired data, produced by work integrated through a historical ecological perspective, which relates to the antiquity of human occupation of the beiradeiro's territory and the relationship between these “recent” inhabitants with an ecological infrastructure built by past occupants that its current occupants manage and promote.

Roche Recinos, Alejandra (Brown University), Andrew Scherer (Brown University) and Charles Golden (Brandeis University)

[54]

Stone Goods and the Organization of Late Classic Period Regional Economies of the Middle Usumacinta River Region

In this paper we present the results of the analysis of nearly 42,000 chert and obsidian artifacts from sites in the Middle Usumacinta River region to examine economic production and exchange at the level of the polity. Our study includes a range of household and non-household contexts, revealing entanglements of the lithic economy within the sociopolitical dynamics of the region during the Late Classic period (AD 600–900). The urban center of Piedras Negras demonstrates a remarkable paucity of long-distance trade goods (e.g., obsidian and greenstone), relative to Yaxchilan, Palenque, and other neighboring polity capitals. Yet, Piedras Negras' subsidiary, Budsilha, enjoyed better access to some of these same goods, likely resulting from the economic networks surrounding an obsidian workshop found at that site. The craftspeople at Budsilha produced far more blades than were consumed at the site itself, suggesting that they were among the major producers in the area. Coupled with other lines of archaeological evidence, these data point to the complicated nature of Maya economies where economic productivity and trade connections were not equally held among polity capitals and subordinate centers may have enjoyed greater economic opportunity than the polity capitals that governed them.

Roche Recinos, Alejandra [265] see Rodas, Ricardo

Rockwell, Heather (Wyoming SHPO)

[190]

East Coast to the High Plains: Expanding Public Outreach Opportunities in Archaeology

Public outreach in archaeology has grown to be an essential part of successful historic preservation offices. I have had the privilege of working for two State Historic Preservation and State Archaeology offices with active and exciting public outreach efforts. This presentation will discuss some of the creative public outreach work that the Wyoming state office is currently undertaking. In addition, I will be discussing some of the current challenges these programs are facing and how we can push forward and remain relevant in the modern era. Finally, I will discuss how programs like these shape the next generation of archaeological scholars and our ability to protect historic resources.

[190]

Discussant

[190]

Chair

Rockwell, Heather [190] see Benney Basque, Yvonne

Rodas, Ricardo (Universidad de San Carlos de Guatemala), Alejandra Roche Recinos (Brown University) and Omar Alcover (Brown University)

[265]

The Practice of Conflict: Slingstones and Fortifications in the Maya Lowlands

Among the Maya, early fortresses and networks of defensive walls suggest that real, or perceived threats were a concern from as early as the Preclassic period (ca. 500 BC). Despite the growing number of fortifications identified, the relationship between defensive features, strategy, and weaponry remains blurred, often discussed as separate elements in the practice of war. In this paper, we investigate the presence of spherical artifacts, potential slingstones, at sites across the Maya lowlands. Specifically, we assess caches of slingstones identified at Macabillero, a Late Preclassic fortress, and at Budsilhá, a secondary center of Piedras Negras in the Usumacinta River Valley. Our analysis is focused on the artifact's morphology, the measurement of physical attributes, and other visible features. Moreover, we incorporate iconographic, archaeological, ethnohistoric, and ethnographic data to argue that these early weapons might have been used at these defensive settlements. We maintain that this type of weapon was likely common across the lowlands, as it required little training to be effective. Through a dual investigation of weaponry and fortifications, we aim to elucidate on the strategies and intended outcomes of violent conflict at different points in time in Maya history.

Rodas, Ricardo [128] see Alcover, Omar

Roddick, Andrew [105] see Reilly, Sophie

Rodgers, Emily**[4]***Petrographic and Geochemical Insights into Ceramic Technology and Provenance on the Paria Peninsula, Venezuela*

This study integrated macroscopic, petrographic, and geochemical analytical techniques to analyze ceramic assemblages from two sites, Quebrada de Balerio and La Alquería, on the Paria Peninsula, Venezuela. The Paria Peninsula is considered a transitional location in the migration of the Saladoid people from the Lower Orinoco to the islands in the Caribbean. Within these assemblages, all of the ceramics stylistically aligned with the Saladoid series, except for one Barrancoid series sherd. Petrographic analysis, X-ray fluorescence, and scanning electron microscopy were used to interpret the provenance of the ceramics, ceramic production methods, and possible correlations between material selection and decorative techniques. The results indicate that the Saladoid series sherds were produced locally, while the Barrancoid series sherd was produced elsewhere. Analysis of the decorative slips and of the grog inclusions revealed a continuity of the ceramic technology and materials source locations within the sites. The integrated analytical approach of this preliminary study displays the potential for future archaeometric studies of ceramics relating to the migration of the Saladoid people.

Rodning, Christopher (Tulane University) and Stephen Acabado (University of California, Los Angeles)**[239]***Game Theory, Chaos Theory, and the Archaeology of Indigenous Responses to Global Spanish Colonialisms*

Dominant historical narratives have favored interpretations that conquered groups yielded to the political and economic might of colonizing powers. Recent models in archaeology, however, emphasize that indigenous responses to colonialism are more complex than succumbing or capitulating to colonial and imperial hegemony, and that indigenous peoples significantly shaped the historical courses of culture contact. This paper considers the applicability of game theory and chaos theory toward explaining indigenous engagements with Spanish colonists in the Philippines and the Native American South. These cases offer examples of indigenous groups making decisions and pursuing strategies meant to ensure that local communities would both survive and thrive in changing geopolitical landscapes, including cases in which groups resisted or accommodated colonial enterprises, or both at once. For example, the Ifugao of the Philippines shifted from dry-rice to wet-rice cultivation after Spanish contact. Although the Spanish colonial regime favored wet-rice cultivation, this practice generated monetary power and political capital for the Ifugao, and enabled successful resistance by the Ifugao to Spanish colonial hegemony. Archaeological and historical sources illustrate that Native American groups navigated and managed the Spanish colonial presence in the American South within indigenous frameworks of warfare and diplomacy, trade and exchange, and monumentality.

Rodríguez, Anabelle (Rutgers University)**[57]***The Archaeology of the (In)visible: Local Expertise and Curatorial Agency at the Xunantunich Archaeological Reserve*

Archaeologists learn to master a particular form of academic discourse that results in public gatherings and specialized publications geared toward the exchange of scientific knowledge. Through these and other related activities, they effectively build up their professional reputations thanks in great measure to the collective efforts of many. A key aspect of my current work on the history of archaeological conservation focuses on stories about fieldwork and nature-culture conservation at the Xunantunich Archaeological Reserve, in Cayo District, Belize. Most of these stories have been shared by local masons, excavators, and a conservation technician from San Jose Succutz and Benque Viejo del Carmen, the two villages closest to the popular site. Other stories about former workers at the site are now emerging after decades of laying dormant thanks to archival research. These oral and written stories voice out individual and collective experiences, aspirations, concerns, and expectations, revealing that it is through the longstanding (in)visible agency of many unsung individuals that the restored appearance and archaeological materiality of Xunantunich has been expertly curated into what is visible to the public today.

Rodriguez, Katherine and Nicholas Herrmann**[215]***Applying Geophysical Prospection to Interpret Historical Burial Practices at Two Cemeteries on St. Eustatius, Dutch Caribbean*

This research examines the relationship between the Old Church Cemetery and the Jewish Cemetery on the Dutch Caribbean island of Sint Eustatius. These cemeteries are located near each other, yet the people buried in them had different religious ideologies and social positions. Utilizing ground penetrating radar and gradiometry, I searched for unmarked burials for a more accurate representation of the cemeteries while they were in use to analyze the cultural relationship between the Dutch Reformed and the Jewish community in the late seventeenth and eighteenth century. In ArcGIS, possible grave anomalies were identified, and the dimensions of extant and possible burials measured. This narrowed down what anomalies could be a burial based on the dimensions of the anomaly. Anomalies that persist throughout the GPR grids or match historical maps were identified as burials. The data suggest potential unmarked burials in the Old Church Cemetery in the Jewish Cemetery. The marked Jewish burials orient northwest to southeast and the marked Dutch Reformed burials orient east to west. Differences in dimensions of extant burials were detected by t-test. These results suggest evidence of different cultural traditions and will be researched further.

Rodriguez, Maria Fernanda [125] see Pintar, Elizabeth

Rodríguez, Mónica [225] see Marengo, Nelda

Rodríguez-Alegría, Enrique [239] see De Lucia, Kristin

Rodriguez Ceja, María [101] see de la Rosa, Yuri

Rodriguez Osorio, Daniel (University of Minnesota)

[246]

Disentangling Landscape: A Political Ecology Approach to the Tairona Regime at the Northwestern Side of the Sierra Nevada de Santa Marta (Colombia)

This paper examines how different environmental contexts and political-economic programs framed the dialectic between the organic/nonorganic elements/participants of the environment (including humans), and yielded uneven transformations of space and matter at the Sierra Nevada de Santa Marta (SNSM), a glaciated mountain located in northern Colombia, inhabited in prehispanic times by several indigenous communities known as the Tairona (200–1600 CE). I draw on results from recent archaeological projects at the massif by analyzing field data gathered on its northwestern side to explore the constitution of a lithic architecture that favored spatial openness and connectivity, over exclusion, as values for the constitution of power and authority. I explore the dialectic whereby the diversity in sources of raw material to build stone terraces, pathways, and staircases, conditioned the building techniques the Tairona implemented, and the ideology and power relationships among them shaped those materials, constituting a social ground for the structuration of the Tairona landscape. Moreover, I utilize GIS and archive information to shed light on the potential scope of the agriculture system developed to sustain the Tairona urban regime. Rather than a primeval forest, I aim to deem the SNSM as a landscape that has been transformed over the past 1,800 years.

[246]

Chair

Rodríguez Pascua, Miguel [197] see Combey, Andy

Rodriguez Romero, Carol [243] see Varillas, Rosa María

Rogers, Ashleigh (University of Queensland) and Marshall Weisler (University of Queensland)

[27]

Limpet (Cellana spp.) Shape Is Correlated with Basalt or Eolianite Coastlines: Insights into Prehistoric Marine Shellfish Foraging in the Hawaiian Islands

The study of archaeological mollusk remains yields important information regarding human foraging as mollusks occur on a range of substrates including rocky shores, coral reefs, mud flats, and sandy beaches while the morphology of their shells reflect their habitat and mode of life. The windward shoreline of Moloka'i, Hawaiian Islands, is formed mostly of smooth basalt boulders or eolianite (limestone) substrate, supporting abundant intertidal rocky shore resources. These contrasting littoral shores influence the composition of the intertidal mollusk populations, but both support large numbers of the ubiquitous Hawaiian limpet (*Cellana exarata*, *C. sandwicensis*, *C. talcosa*). We wanted to know if shell shape (i.e., form and dimensions) of the Hawaiian limpet varied between shoreline types. In other words, could the shape of archaeological limpets indicate particular shorelines where prehistoric foragers obtained these shellfish? We sampled modern mollusk populations on basalt and eolianite coastlines and compared the results to species composition and shape in late prehistoric archaeological middens adjacent to the sampled areas. While the three limpet species inhabit different elevations along the littoral shore, our results demonstrate that modern limpet shell shape (and archaeological limpet assemblages) correlates to basalt or eolianite coastlines thus providing new insights into prehistoric Hawaiian foraging practices.

Rogers, J. Daniel [26] see Kohler, Tim

Rogers, Thatcher (University of New Mexico)

[71]

Dusting the Tomes Off: Quantitative Investigations into Charles Di Peso's Paquimé

The recent surge in studies of inequality, social networks, and chronometric assessment of archaeological sites in the American Southwest demonstrates the value of revisiting published and unpublished data. These approaches, however, have seldom been applied to prehispanic communities located along the contemporary U.S.-Mexico Border or in Northern Mexico. This is problematic as arguably the most sociopolitically complex community and a polity core in the prehispanic Southwest/Northwest, Paquimé, is located there. Excavations at Paquimé by Charles Di Peso and colleagues and the publication of nearly all excavation data in a set of analytical volumes have set and inspired nearly all consequent investigations into the Casas Grandes culture. In this talk, I quantitatively investigate the published and unpublished architectural, ceramic, and chronological data from Paquimé and nearby communities to facilitate a regional comparison and context for Paquimé.

Rojas, Manuel [74] see Gayo, Eugenia

Rojas Sepulveda, Claudia [134] see Hall, Sarah

Roldan, Jonathan [53] see Mitchell, Spencer

Roldan, Jonathan [178] see Rutherford, Cady

Rolett, Barry (University of Hawaii)**[24]***From Dune Stratigraphy to a Model-Based Cultural Sequence for the Marquesas Islands of East Polynesia*

The Marquesas Islands comprise part of East Polynesia, a culture area that also includes Hawai'i, New Zealand and Tahiti. Calcareous sand dunes are rare in the Marquesas but play an outsized role in Polynesian archaeology. Dune sites yield remarkably rich evidence of human settlement and the preservation of organic remains is unparalleled. Yet the stratigraphy of these sites is complex. Drawing upon results from the excavation of key Marquesan dune sites (Hanamiai, Ha'atuatua and Hane), this presentation examines the value of biomarkers and chronologically diagnostic artifacts in constructing chronological models. Prominent markers, such as the remains of extinct fauna, allow the correlation of stratigraphic sequences within and among sites. A two-phase cultural sequence is defined, consisting of the Archaic and Classic eras. The Archaic era, representing initial human colonization and a period during which distant communities were linked by systematic long-distance voyaging, is particularly significant because its defining traits are widely distributed across East Polynesia. A model-based approach incorporating both stratigraphic and artifact sequences lays the foundation for resolving questions concerning human colonization of the Marquesas and other East Polynesian archipelagoes, as well as the duration of the Archaic era.

Rollefson, Gary [125] see Heidkamp, Blair

Rolph, Kevin (College of Wooster) and Olivia Navarro-Farr (College of Wooster)**[213]***Tools of the Trade: An Ethnohistoric and Archaeological Examination of Tools Used in the Fur Trade in Southern Ohio*

The arrival of Europeans to the New World forever changed the social and economic landscapes of Native Peoples who occupied the continents. Colonial institutions profited off the land and those who occupied it. One institution that exemplified this was the Fur Trade. Throughout the North and Northeast colonies, European nations acquired furs from a variety of mammals to meet the trans-Atlantic demand. To maximize profits in the New World many European colonizers turned to Native peoples to aid in their economic endeavors. Native Americans employed trade routes and knowledge of the land to their advantage in the new economic landscape. In this poster, we illustrate the role that the Late Prehistoric/Early Historic people played during the Fur Trade by investigating, the context for two hide-processing tools, endscrapers and beamers which appear to spike in usage during the period of (1450–1750 C.E). We evaluate Ethnohistoric evidence to determine whether the Native peoples may have been engaged in hide production work as a response to increasing European demand.

Román, Katherine**[141]***Tracing the Past: Ancient and Modern Borrowing of "Foreign" Imagery in Paracas*

Through time, people have assimilated, appropriated, and used foreign (i.e., nonlocal) symbols and motifs that were considered significant at the time due to religious, political, or ideological reasons. During the Formative period (1700–200 BC), the Paracas groups settled in the Peruvian south coast incorporated Cupisnique motifs from the north coast into their visual repertoire, as depicted in their world-renowned textiles and pottery. Nowadays, Paracas artists crafting souvenirs for sale have adapted precolumbian designs from other regions of Peru, both as a recognition of its value and a connection with their heritage as well as a result of the lack of local referents. In this regard, these concepts of transmission, borrowing, and remaking of ideas in the process of craftsmanship are analyzed, with the goal of identifying possible parallels in how images transcend territories.

Roman-Ramirez, Edwin (Proyecto Arqueológico del Sur de Tikal)**[209]***Discussant***Romero, Ashuni (CINAH Quintana Roo) and Nelda Marengo****[189]***"From the Coast to the Jungle: Inventory and Record of Archaeological Sites in Puerto Morelos, Quintana Roo, Mexico"*

The municipality of Puerto Morelos is located in northern Quintana Roo, Mexico. Beginning in the past century, and continuing through present day, researches have reported numerous archaeological sites in this region. However, many of them do not have a precise location, and we do not know about their conservation status. As a result of this issue and the large growth of modern infrastructure in the area, I created the "Proyecto de Inventario y Registro de Sitios Arqueológicos en el Municipio de Puerto Morelos, Quintana Roo" (Inventory and Record of the Archaeological Sites in Puerto Morelos, Quintana Roo Project), which seeks to update information for archaeological sites in the Puerto Morelos region. My main goals include: gaining information on the actual condition of the sites and gaining knowledge about cultural processes of the area.

Romero, Danielle (University of Nevada, Las Vegas)**[122]***Looking through the Mirror: Design Similarities on Mimbres Decorated and Corrugated Ceramics*

Ceramics research within the Mimbres has been conducted at length with a majority of the research focused on the various types of decoration while corrugated and other textured wares are put to the side as standard cooking vessels. The variety and temporal changes in decorated elements and motifs have been scrutinized for their applications to individual and group identity and their relationship to changes in ideology and other social systems. Although not as rapid or varied, textured wares also underwent changes and saw the rise of stylized Reserve types. Recent excavations at the Elk Ridge site have yielded vessels from different

wares that share similar stylistic traits indicating that the textured wares may serve similar purposes of signaling outside of their utilitarian purpose. Using vessels recovered from the Mimbres Valley, this research analyzes decorated rim designs and their potential analogues on textured wares.

Romero, Danielle [122] see Shikrallah, Elizabeth

Romih, Sasha (Fort Huachuca Cultural Resources)

[165]

The Historic Railroad at Fort Huachuca, AZ

The Fort Huachuca Cultural Resources program presents the first archaeological recording and investigation of the historic Fort Huachuca, AZ railroad. The railroad played a crucial part in the development of one of the oldest Army Forts in the country, and access to rail largely contributed to which forts lasted into the modern Army Corps. Set in a high-altitude desert littered with tall shrub grass and mesquite trees that characterize Western Era films, Fort Huachuca has been a center of Southwestern pioneer history for well over 100 years. A large portion of the Old Post was made a National Historic Landmark in 1976, including dozens of buildings and a parade field, but the rail tracks were already gone by then. While the tracks and rolling stock of the Southern Pacific owned Lewis Springs line are long gone, much of the railroad grades and ballast are still intact. Over 10 wooden trellises, a wooden bridge, and thousands of glass, metal, and ceramic artifacts make up the site of the old railroad. In partnership with several local museums and historical societies, dozens of historic maps and archival documents contributed to reconstructing the extent of the railroad, and documenting its history.

Rondeau, Rob (Simon Fraser University) and Chris Carleton (Max Planck Institut fur Chemische Okologie)

[82]

Beringia Underwater: The Search for New Archaeological Sites

In the last twenty years, advances in underwater remote sensing technologies, computational sciences and undersea mapping now allow us to search for archaeological sites on the submerged continental shelf. A larger sample size of archaeological sites pre-dating 12,000 cal BP in Alaska, Yukon and parts of the Pacific Northwest Coast helps us predict where best to look for new sites. A new predictive model developed at SFU, the Locally-Adaptive Model of Archaeological Potential (LAMAP), recently used 182 sites in Central Alaska to predict possible new sites there. LAMAP has also successfully identified archaeological sites in Central America and Turkey. Now, the goal is for it to do the same on the Pacific Northwest Coast, predicting the location of new early sites there.

Rondeau, Rob [238] see Carleton, William

Roney, John [5] see Lazik, Lauren

Roney, John [122] see Whisenhunt, Mary

Roney, John [156] see Zaragosa, Gabriella

Rooney, Matthew (University of Florida)

[3]

Introducing Ethnohistorical Evidence for Charity Hall, an 1820s Chickasaw Boarding School in Mississippi

After the French and Indian Wars of 1763, British traders poured into the lands east of the Mississippi River, including North Mississippi where the Chickasaws lived. They ignored British prohibitions on trade, and many intermarriages occurred, resulting in a mixed-ancestry population that emerged as a new ruling class. It was these Chickasaws who, in the years leading up to removal, invited missionaries into their territory to build schools, including Charity Hall, which has now undergone two summers of archaeological field excavations. The archaeological investigation of Charity Hall is significant because it is only the second Civilization Fund Act school that operated during that first decade ever examined materially in the southeastern United States. Over the past century, those interested in both the church and the tribe have collected documentary evidence of the day-to-day operations of the school, including letters written by founder Reverend Bell himself to the Indian Office of the Department of War, which was largely responsible for funding the operation. This paper will review an amalgamation of ethnohistorical materials and show how they enhance our archaeological field investigations.

Roos, Christopher (Southern Methodist University)

[117]

Discussant

Roos, Christopher (Southern Methodist University)

[255]

Up in Flames: How an Independent Archaeology Made a Pyrogeographer

Well-preserved and well-replicated paleobotanical assemblages from the Grand Canyon area led Alan Sullivan to develop a model of anthropogenic burning to enhance the productivity of wild resources. He has spent the better part of three decades assembling evidence to support this model. During this time, I was an undergraduate student under Sullivan. Although the anthropogenic burning story was not motivating for me at the time, twenty-first-century megafires in the Southwest changed my perspective. How had Native people coexisted with fire-prone environments for centuries when in less than one century our communities face existential threats from wildfire? Independent Archaeology taught me the importance of thoughtful assessment of what made evidence relevant for particular research questions. I knew that to assemble relevant evidence to answer human-fire sustainability

questions, I had to look beyond archaeology. Beyond archaeology was a realm of important human-fire-climate research questions to which archaeological information had value. In thinking like an “independent” archaeologist, I ultimately found my way to the holistic science of fire on earth. Sullivan's Independent Archaeology set me on a trajectory to become a pyrogeographer.

[255]

Chair

Roosevelt, Anna (University of Illinois, Chicago)

[127]

Animism in Amazonia

The myths and arts of Amazonians today and iconography of the ancient art suggest that animism as a religion and social concept has long influenced thinking and action in the basin. A central characteristic of this animism is belief in the innate interconnectedness of life-force, landscape, society, and personhood among humans, deities, plants, and animals in Amazonian land, water, and sky. Whether the Amazon Woman Shaman, her anaconda spirit animal, the hallucinogenic Banisteriopsis vine, and certain trees in the living Amazon river and in the otherworldly river of the Milky Way Galaxy, or her suitor the Sun with macaws, harpy eagles, and the stellar beings in the sun's paths between the solstices, or some other nexus of deities, humans, animals, and spaces, such connections are evident since people entered the basin. People made the connections from a solid base of social and natural science knowledge, and their concepts reveal an acute understanding of social behavior, reproduction, ecology, and astronomy through time and space. As examples of Amazonian animism, its use, and its variation in time and space, this paper analyzes images and ideas from early prehistoric sites to modern peoples of both white-water mainstream and black-water tributaries.

Rosales, Edgar

[10]

Mica in Xalla: A Glittering Archaeological Indicator of Power and Specialized Production

Mica, a shiny silicate mineral with a layered structure, was highly valued by the Teotihuacan people. Mica has unique physical properties, but we propose that the most striking one was of an optical nature, owing to the fact that it is a multicolored specular material. The Teotihuacan elite groups emphasized this value, so they preferred micaceous species of golden tones, to handicraft production specializing in shiny luxury items. More than 90% of the mica found in the Classic city is concentrated in two compounds, to the north and the south of the Sun Pyramid: the Xalla Palace and the Viking Group. This research describes approximately 37 kg of sheet mica found in Xalla during the Project Teotihuacan. Elite and Government, but also the provenance and contexts in which prehispanic mica has been found, as a foreign raw material imported from the Valley of Oaxaca and Ejutla, in the cosmopolitan city in Central Mexico. This workshop under state control shows us a center of exceptional economic and religious strength.

Rosales, Verónica [260] see Muñoz, Lizette

Rosch, Heather

[159]

Making Do with What We've Got: Understanding Rural Ottoman Life using the Sources Available

Despite repeated calls to action by a handful of archaeologists, there is still a deficiency of targeted research being conducted on the Ottoman Period within our field. When the material and information available from archaeology is lacking, the full picture of Ottoman rural life is best understood through a combination of sources. This has been the case in the rural areas of southwestern Anatolia, where there is little archaeological knowledge about Ottoman residents from which to pull information. Here excavations are less effective due to the often ephemeral nature of settlements and historical research was less popular in favor of studies of the elites and city dwellers for many years. Recent efforts from survey projects can be combined with the available historical and ethnographic research to understand human occupation throughout the Ottoman period. With the Burdur-Isparta region as a case study, each field can provide pieces of the puzzle through which aspects of life such as land tenure, ceramic manufacture, and interaction with other areas, can be understood.

Roscoe, Paul (University of Maine)

[146]

Apocalyptic Responses to Severe Climate Change: Modeling National Vulnerabilities

Given currently inadequate mitigation of greenhouse gas emissions, it is increasingly likely that many parts of the world will be exposed to severe climate change. Throughout human history, troubled times have provoked apocalyptic—End-of-Times—responses, and there is little reason to believe they will not emerge under severe climate change as well, greatly complicating mitigation and adaptation responses. Because apocalyptic interpretations and movements evolve only under particular conditions and in specific social-structural niches, however, nations differ markedly in their vulnerability to them. Drawing on the European historical record and fieldwork on New Guinea millenarian movements, this paper attempts a preliminary modeling of these vulnerabilities.

Rosen, Arlene (University of Texas at Austin) and Lisa Janz (Trent University)

[125]

"The Brown Steppe Is Like an Ancient Story": Foraging the Arid Steppe and Wetlands in the Middle Holocene of the Mongolian Gobi Desert

Recent studies have highlighted the importance of wetlands to mobile foragers in semi-arid environments. This is evident among

past foragers of Western North America, as well as in the Levantine Epipaleolithic. Resources remain abundant around marshes, even when plant and animals in the arid lands surrounding them are much less predictable and yield only sparse patches of food. Current research in the eastern Gobi Desert of southern Mongolia demonstrates that once the present-day desert steppe was lush, with endorheic lakes and their surrounding wetlands punctuating the landscape. These lakes were mostly saline throughout much of the Late Pleistocene, and disappeared by the beginning of the Holocene. However, new geoarchaeological and phytolith research shows that former Pleistocene lakebeds supported small freshwater ponds and wetlands during the Middle Holocene. These marshes formed a rich environment for hunter/gatherers who found reliable sources of grass seeds, rhizomes of sedges, and a variety of animals concentrated near these water sources. The reliably resource-rich points on the semi-arid landscape minimized subsistence risk, and facilitated movement of hunter-gatherers throughout this region of the otherwise inhospitable Gobi Desert, up until the period of time when pastoralists began to dominate this landscape, ca. 3500 years ago.

Rosen, Arlene [171] see Damick, Alison
 Rosen, Arlene [62] see Farquhar, Jennifer
 Rosen, Arlene [40] see Hart, Thomas

Rosen, Steven (Ben-Gurion University)

[171]

Between the Rock and the Hard Place: Cyclicities of Adaptation in the Negev over the Long-Term

From Late Pleistocene through recent times, the nomadic societies of the Negev have adapted their lifeways to ever changing environmental and social circumstances. Superimposed on the arid environment and the specific geography of the region, yearly cycles of movement, exploiting resources available during different seasons, transformed over the millennia to ever more complex patterns. The seasonal cycles and their long-term changes can be integrated into a larger harmonic set of fluctuating habitation florescence and decline in the region. With respect to the seasonal cycles, a basic ecological substrate of mobility based on aggregation/dispersal according to seasonal availability of subsistence resources is well evident. Over the long term, an increasing number of factors affected the seasonal round, including adaptation to environmental change, the increasing influence of social factors such as subsistence and technological change, ideology, and the impact of external politics. The changes in the seasonal round include increased number of functionally different seasonal stations, increased seasonal fission into functionally distinct subgroups, increased external connections, and expanded geographic zonation.

Rosencrance, Richard (Museum of Natural and Cultural History)

[195]

Diachronic Western Stemmed Tradition Lithic Technology during the Younger Dryas at Connley Cave 4, Oregon

The majority of Western Stemmed Tradition (WST) sites are surface assemblages and those found in buried contexts are typically small. Lithic analyses of surface sites benefit from large sample sizes, but are limited by equifinality in terms of tool kit composition and raw material use. Excavations by the University of Oregon Archaeological Field school have uncovered over 200 WST lithic artifacts in a well-dated buried context spanning the Younger Dryas at Connley Cave 4, Oregon. Coupled with the nearly 200 artifacts recovered by Stephen Bedwell in the late 1960s, Connley Cave 4 has one of the largest diachronic WST lithic assemblages in the Americas. This paper examines projectile point, core, and flake tool technology as well as raw material selection and conveyance of these three WST assemblages.

[195]

Chair

Rosencrance, Richard [170] see Jenkins, Dennis
 Rosencrance, Richard [66] see Quiroz, Itzel
 Rosencrance, Richard [66] see Saper, Shelby
 Rosencrance, Richard [236] see Stueber, Daniel
 Rosencrance, Richard [195] see Sturtz, Sara

Rosenswig, Robert (University at Albany)

[23]

The Adaptive Mosaic of Mesoamerica's Archaic Period

Mesoamerica's Archaic period (10,000–4000 BP) lasts longer than the Formative, Classic, Postclassic, Historical, and Modern periods combined. Therefore, it is at once the most important and understudied epochs and the time when maize, beans, cacao, and a host of other plants were domesticated in the region. As one of a small handful of centers of food production, these developments are of more than local significance. This paper characterizes Mesoamerica's inhabitants during Archaic period as forming a mosaic of adaptations. In particular, I compare the Soconusco zone of southern Mexico and northern Belize as the first and last places to adopt ceramic container technology and sedentary village life. Despite these differences, the inhabitants of both regions shared a similar diet of mixed foraging and horticulture.

[23]

Chair

Rosenswig, Robert [26] see Ortman, Scott

Roskams, Steve [188] see Humphreys, Stephen

Rospopo, Steven and Linda Wheelbarger (San Juan College)**[236]***Lithic Analysis from the Point Pueblo Chacoan Great House, Northwestern New Mexico*

The 2019 San Juan College field school excavation at the Point Pueblo D-Shaped Chacoan Great House yielded an impressive quantity of lithic material including a Tchamajilla, several projectile points, axes, ground stone, lithic cores, lithic formal and informal tools, and debitage. Limited excavations were conducted on four large multi-story rooms attached to the north side of the Great House. Lithic analysis will focus on artifacts from the western portion of Room 34 which also contained a large concentration of Pueblo II ceramics associated with a Chacoan occupation of the structure dating between AD 1070 and 1140. Discovery of the northern wall of Room 34 at a much lower elevation than expected suggests that the integrated multi-story rooms were terraced into the slope overlooking the San Juan River. This multi-component analysis provides analytic information on the Room 34 lithic assemblage, which will complement concurrent analysis of ceramics from the Point Pueblo Great House and aid in demonstrating the extent of Chacoan influence and interaction at Point Pueblo.

Rossi, Franco (John Carter Brown Library, Brown University) and Heather Hurst (Skidmore College)**[57]***Communities and Concessions: Archaeological Storytelling and Public Engagement in a Biosphere Border Zone*

The archaeological sites of San Bartolo and Xultun sit in the Maya Biosphere of Northeast Guatemala in a zone designated as part of the Árbol Verde forest concession granted to nine communities living in northeast Petén. The Árbol Verde Concession was one of several forest concessions granted after the Guatemala Peace Accords (1996) aimed at promoting forest stewardship and sustainable land practices among communities in Petén, a border region associated with licit and illicit resource extraction and trafficking of various kinds (the looting of archaeological materials among them). The closest community to SB-X, but outside of the Árbol Verde concession, is the village of Uaxactun, which has a long history as a chicle camp, archaeological project headquarters for the Carnegie Institution, and most recently positioning itself as an eco-tourism gateway into Petén. Although there is not a nearby descendant community that identifies with ancient SB-X, local community participation in the archaeological project has forged a connection to the site through economy, landscape, and cultural heritage. This paper explores some of the questions and complexities of multilingual storytelling, engagement of different "publics" and competing interests of local communities in a biosphere border zone.

Rossi, Franco [138] see Hurst, Heather

Rossouw, Lloyd [162] see Bousman, Britt

Rotella, Brianna and Kaitlin Brown (University of California, Santa Barbara)**[239]***Comparing Chumash Communities at Mission San Buenaventura and Mission La Purísima Concepción*

Between 1782 and 1812, Chumash communities throughout south-central California relocated to mission establishments along the coast and inland valleys. Mission San Buenaventura was the first mission built in the Santa Barbara Channel region and it primarily included coastal and Northern Channel Island populations. In contrast, Mission La Purísima Concepción was the last mission to be constructed in the Chumash area and was mostly composed of Native peoples from Santa Ynez Valley. This paper explores similarities and differences in the artifacts recovered from the Native Family Apartments within these two Mission spaces using both existing museum collections and recent archaeological investigations. By comparing and contrasting systems of trade and exchange, local industries, and foodway practices, we examine how different Chumash groups responded to colonialism at distinct moments in time, negotiated their social identities in mission spaces, and maintained key aspects of cultural continuity throughout the early and late Mission Period.

Roth, Barbara (UNLV)**[136]***Great Kivas and Community Integration during the Pithouse Period: Insights from the Harris Site*

The Harris site was a thriving pithouse village in the Mimbres River Valley during the Late Pithouse period from ca AD 500 to the late AD 900s. Households occupying the site were integrated into the community via a series of sequentially-used great kivas surrounding a central plaza. This paper discusses the role of these great kivas in the Harris community using data from UNLV's excavations of a Three Circle phase kiva and associated plaza features in use during the early AD 800s coupled with data from Emil Haury's excavations three great kivas, including one large later Three Circle phase kiva (House 10) that was ritually burned. I discuss the ways that different household groups were integrated into the community through time, the role of ritual sponsorship by particular households in community integration, and the impact of the burning of House 10 on the Harris community.

Roth, Barbara [6] see Person, Dylan

Routledge, Jennifer (Trent University), Lisa Janz (Trent University) and Paul Szpak (Trent University)**[76]***Ostrich Extirpation from the Eurasian Steppe*

Around the Pleistocene/Holocene transition, changes in climate and environment on the Eurasian Steppe led to the extirpation of *Struthio asiaticus* (the Asian ostrich). Stable isotope analysis conducted on samples of archaeological ostrich eggshell, from sites circumscribing the steppe, has provided $\delta^{13}\text{C}$, $\delta^{15}\text{N}$ and $\delta^{18}\text{O}$ results which aid in the reconstruction of these environmental shifts and help us speak to the circumstances surrounding the extirpation of the species. Samples span a time depth of 40,000 years and

include the period prior to regional extirpation. A change in the monsoon belt at the Holocene transition led to increased moisture and changes in the vegetative profile of the steppe. *Struthio a.* adaptations to hot dry environments likely became maladaptive under these circumstances, factoring into their demise.

Rovanpera, Jennifer [236] see Thompson, Thomas

Rowan, Yorke [125] see Heidkamp, Blair

Rowe, Brian [30] see Parish, Ryan

Rowe, Chris [187] see Howe, David

Rowe, Robert

[198]

Please Don't Call Them Megafauna

The Pleistocene...basically a no-man's land that is trapped between the disciplines of archaeology and paleontology when it comes to the animals that inhabited that period. For American archaeologists they are sometimes too old to consider them as having archaeological connotations. For the Paleos, these are not fossils and by some standards are considered too young for their studies. It is important for archaeologists to understand these animals and their environmental niches. There are specific reasons on where and why these animals are found in archaeological context. This paper focuses on bison, mammoth, the occasional sabre cat, and a few other species that have been found in archaeological context. Using field examples from several states, the remains of these animals can be used to ascertain the environment that each lived in and in doing so this data can be used to widen the databases of the prehistoric environment in which the earliest of humankind in the Americas survived. Whatever you do, don't call these animals "Megafauna".

Rowe, Sarah (University of Texas Rio Grande Valley) and Guy Duke (University of Texas Rio Grande Valley)

[257]

Going Their Own Way: New Insights on Valdivia Culture from the Buen Suceso Site

Archaeological investigations of the Buen Suceso site continue to complicate syntheses of the Valdivia culture, one of the earliest ceramic traditions in the Americas. Buen Suceso is one of the few sites with occupation from every phase of the Valdivia tradition, dating between 3700 and 1450 BC. While never static, occupation at Buen Suceso could best be described as conservative, as social practices characteristic of the earliest phases are maintained, and possibly reified, even in later phases. Further, patterns of increasing social differentiation that have been noted from other sites, including spatial reorganization, mound construction, differentiated burials, and the elaborated use of spondylus, are largely absent from Buen Suceso. Instead, there is tantalizing evidence to suggest that the inhabitants of Buen Suceso pursued practices that stood in opposition to these societal trends. This paper focuses on two areas of the site, representing occupation of both Early and Middle Valdivia, to explore the ways in which occupants of Buen Suceso constructed their social world.

Rowe, Victoria [36] see Coolidge, Frederick

Royal, Kyleigh [17] see Buchanan, Briggs

Royer, Julien [78] see Waterman, Anna

Rozwadowski, Andrzej [25] see Jiménez Pasalodos, Raquel

Rubinatto Serrano, Juliana (Wake Forest University) and Paul Thacker (Wake Forest University)

[36]

Eagle Owl Prey Assemblages and Biostratigraphic Processes: the Archaeological Implications of Dispersal, Transport, and Time Averaging

Pellet, nesting, and roost accumulations have yielded critical middle-range benchmarks for interpreting strigiform prey assemblages at archaeological sites. Few studies, however, explicitly examine dispersal dynamics, transport mechanisms, and time-averaged accretion that impact bone assemblages from birds of prey hunting prior to cave and rock shelter burial. This poster examines taphonomic patterns resulting from preburial processes affecting Eurasian Eagle Owl (*Bubo bubo*) prey assemblages along the karstic cliffs and slopes at the Abrigo de Vibora rockshelter complex in Portugal. Rabbit and rodent remains dominate the recovered collection with smaller numbers of voles, shrews, hedgehogs, pigeons, and other birds present. In contrast to samples from nest and roosting contexts, element sorting and differential preservation are linked to dispersal and downslope movement through slopewash. Recovered small mammal element ratios change as distance increases from the immediate drop zone although some classic eagle owl diagnostic indices remain intact. Bias introduced by collection procedures including sediment sieve-size is explored. Time-

averaging of the downslope bone accumulations is demonstrated by the recovery of banded racing pigeon elements. The sorting processes and extended time interval of slow downslope accumulation at Abrigo de Vibora provide important middle-range theory for archaeological interpretation of bone assemblages from cave and rockshelter contexts.

Rubio, Alison [184] see Wescott, Konnie

Ruby, Bret (National Park Service, Hopewell Culture National Historical Park), Rainer Komp, Friedrich Lüth, Lukas Goldmann and Sebastian Messal

[107]

Geophysics and Changing Perceptions of the Hopewell Mound Group

The Hopewell Mound Group is one of the largest, most complex, most famous, and longest-studied monumental Indigenous landscapes in North America. Fieldwork marking the very dawn of Americanist archaeology began here in the early nineteenth century and encountered a striking set of material symbols of such artful quality, prodigious quantity, and astonishing diversity to have been rightly recognized as the type collection for the Hopewell horizon. However, agricultural plowing steadily eroded the above-grade features. Recently, the National Park Service forged an international partnership with the German Archaeological Institute to complete a high-resolution, landscape-scale geomagnetic survey of the entire complex. The results reveal subsurface landscapes of unexpected integrity and complexity, marked by ditched enclosures, shrine buildings, timber post circles, communal earth ovens, and other previously unknown ritual architecture. These results wrap a new contextual frame around the findings of the older investigations. This paper will correlate the new geomagnetic contexts with observations made during the foundational expeditions of Squier and Davis, Moorehead, and Shetrone, with particular attention to mound composition and stratigraphy, prepared floors and pavements, sub-mound structures, and purposeful deposits.

[107]

Chair

Ruffe, Danielle (University of Texas, Austin) and Manda Adam (University of Texas, Austin)

[206]

Ancient Maya Architecture Detection Using Lidar and Machine Learning

Due to its ability to penetrate the dense canopy, Airborne light detection and ranging (lidar) has become a revolutionary tool for understanding the Maya Region. Due to the customizable nature of lidar data, researchers can create algorithms to train computers to automatically detect a suite of anthropogenic modifications. While some anthropogenic modifications can be visually identified, traditional visual identification is time-consuming and can result in features being missed. Creating algorithms and employing automatic feature extraction techniques saves valuable time and allows for the identification of features that may not be visible to the human eye. This project will focus on the development of using computer-training methods to detect ancient Maya architecture using lidar collected in northwest Belize, in particular the site of Gran Cacao, which is approximately 4 km². Using lidar-based Digital Elevation Models (DEMs), training sites will be programmed into artificial intelligence from past field research excavations. In addition, this project will test the feasibility of automated feature extraction techniques to portray site organization and define feature groups.

Ruhl, Thomas (University of Cincinnati)

[178]

Chultunes, New Scale and Perspective

Chultunes have been a topic of investigation for more than a century, since Thompson's work at Labna. Suggestions over their purpose have gone in every direction since then, and the only consensus that seems reachable today is that they are multi-purpose, both in space and time. However, this is the result of a bias integral to this topic of investigation from its start. This study addresses this issue by offering another perspective and another scale of investigation on the topic. We build a database of a maximum of documented chultunes to truly capture the spatial and temporal distribution of the features, their attributes, or combinations of characteristics, across the Maya Lowlands. We can then compare the results with the patterns of other characteristic features of Maya civilization, such as reservoirs, and look for correlations, positive or negative. Only this way can an issue presenting so much variability be better understood. Also, the subject receives a more thorough anthropological look, acknowledging bias, looking at its sources, and proposing a different view of these human-made subterranean chambers. The data built through this process will be available open-source to allow updates, further additions, and more importantly, comparisons with databases on other topics.

Ruiz, Judith (UNAM), Isabel Casar (UNAM, Mexico) and Vera Tiesler (UADY, Mexico)

[225]

Human Sacrifice and Body Processing in Eastern Mesoamerica Past the Maya Collapse: New Evidence from Toniná, Lagartero, and Champotón

A number of non-reverential, highly processed human assemblages containing mutilated sternal bones have been documented in different parts of Postclassic period Mesoamerica and beyond after being described by Carmen Pijoan in a massive ritual deposit from Tlatelolco, in the Aztec capital. In this presentation, we document and interpret five such deposits. These come from three securely dated Eastern Mesoamerica contexts at the sites of Toniná and Lagartero, two late centers in the Chiapanecan Highlands, and Champotón, on the west coast of the Yucatecan peninsula. All damaged sternal bones display forceful horizontal or diagonal blows to green bone, which appear to have severed the upper from the lower segment in one single action. All contexts show additional signs of having been flayed, defleshed, and disarticulated. Six pairs of adult hands and three more pairs of feet were recovered from one of these assemblages. Bioarchaeological isotopic research provides glimpses into the lifestyles and diets of the

individuals, while skeletal imagery prompts reflections on the possible ritual choreographies and ceremonial occasions surrounding their deaths, namely those related to Xipe rituals.

Rumberger, Jacklyn [189] see Joyce, Arthur

Runggaldier, Astrid (University of Texas, Austin)

[128]

Modular Building Blocks: How Essential Features of a Maya Palace Could be Scaled and Recombined from Late Preclassic Times Onward

As with other forms of ancient architecture, investigation of Maya palaces over more than a century focused first on Late Classic structures. Only subsequently, over recent decades, interest in earlier palaces drove researchers to ask new questions that refined discussions over identification, morphology, function, and ultimately definition of what constitutes a Maya palace. Some of those questions are still largely open-ended, with differing opinions on whether palaces exist in the Preclassic period, what kinds of inferences emerge about the institutions of rulership they are connected with, and how those institutions, and by extension palaces, change from Late Preclassic, to Early Classic, and later periods. Many features understood as characteristic of Maya palaces, such as high degrees of regional variation, or the conflation of administrative and residential functions, were ascribed to these architectural complexes on the basis of Late Classic forms, often the result of centuries of evolution and change. This presentation revisits a Late Preclassic palace, which was rebuilt in later centuries, at the site of San Bartolo in Guatemala, where some of the basic functional features of a palace were clearly identifiable, and are recognizable as essential elements across a wide range of palaces in the Maya Lowlands.

Runggaldier, Astrid [17] see Covey, R. Alan

Runggaldier, Astrid [14] see Flanagan, Kelin

Runggaldier, Astrid [109] see Granados, Rosario

Rusch, Bruce (NH SCRAP)

[190]

Using the SCRAP System as a Platform for the Advancement of Archaeological Knowledge in the State of New Hampshire

The New Hampshire State Conservation and Rescue Archaeology Program (SCRAP) is a public participation program for archaeological research, management, and education. New Hampshire's Archaeology Division conducts field schools and workshops to train interested members of the public in archaeological research skills, interpretation, conservation, and education. SCRAP seeks to increase site discovery and evaluation, to reduce the rate of site destruction, to recover information from archaeological sites about to be destroyed, to inform the public, and to conduct original research. This paper deals with the original research aspect of SCRAP's goals and mission statement. From the inception to the final days of the investigation and conservation of a field site, several archaeological and anthropological questions are generated. These questions often relate to issues surrounding ecological context, horizon placement, site formation, function or site use, in addition to the site's inhabitants' behavioral characteristics. Each of these speculative questions provides fertile grounds for original research. Discussed in this paper are two Paleoamerican sites investigated and recorded by the SCRAP organization that provided original research and insights into Paleo horizon settlement patterns in New Hampshire.

Russ, Jon (Rhodes College), Umer Aziz (Rhodes College) and Morgan McDonald (Rhodes College)

[63]

SPME/GC-MS Analysis Archaeological Smoking Pipe Residues

Solid Phase Micro-extraction (SPME) is a solvent-free sample extraction method. The SPME contains a needle-like fiber that is coated with a polymer that adsorbs organic compounds, typically in the headspace above a sample sealed in a vial, thereby eliminating the need to dissolve samples in a solvent. After exposed to a sample, the SPME can then be placed into an injection port of a gas chromatograph, which releases the absorbed organic compounds into the instrument for analysis. There are many beneficial uses for SPME applied to organic residue analyses of archaeological artifacts, in large part because samples do not need to be dissolved in an organic solvent. The only modification is by applying moderate heat to a sample, which is well below the combustion point of organic compounds. Thus, organic residue analysis can be applied to samples scraped from an artifact or even intact artifacts. The aim of this study was to investigate the efficacy of SPME for organic residue analysis of prehistoric smoking pipes. We conducted temperature and time trials to optimize the SPME method for maximum extraction, as well as analyzing previously-tested archaeological samples to verify that the SPME can detect the same compounds detected using GC.

Russ, Jon [211] see Davis, Jera

Russ, Jon [215] see Fields, Mara

Russ, Jon [63] see Tolan, Grace

Russell, Bradley [269] see Hare, Timothy

Russell, Bradley [20] see Glumac, Bosiljka

Russell, Bradley [138] see Masson, Marilyn

Russell, James [235] see Perrotti, Angelina

Rutherford, Cady (University of Texas, San Antonio), Marisol Cortes-Rincon (Humboldt State University), Jonathan Roldan (University of Nevada, Las Vegas) and Spencer Mitchell (University of California, Santa Barbara)
[178]

Wonky Structures or Wonky Tree Falls? Ground Truthing and Further Discoveries in a Hinterland Maya Household

Continued excavations at a hinterland Maya household have uncovered construction sequences, interesting architecture, and ancient tree falls able to confuse both lidar and survey results. Research in the area of hinterland households will help to build our understanding of variation present within and between regions. This analysis examines construction methods, the size and layout of this household group, the raw materials used, crafting, and access to trade goods in order to identify household level variations and access to resources in this hinterland area. Recent excavations have begun to illuminate the construction sequence of the household as well identifying structures where the lidar and mapping data was misled by tree fall or other postdepositional processes.

Rutherford, Cady [230] see Cortes-Rincon, Marisol

Rutherford, Cady [53] see Mitchell, Spencer

Ruvalcaba, José Luis [20] see Alonso, Alejandra

Ruzo, Luis Octavio [242] see Schofield, Abigail

Ryan, Elisa (U.S. Bureau of Reclamation)

[92]

Discussant

Ryan, Karen (Canadian Museum of History), Elsa Cencig (Avataq Cultural Institute), Susan Lofthouse (Avataq Cultural Institute) and Tommy Weetaluktuk (Avataq Cultural Institute)

[50]

The Social Lives of the Qajartalik Petroglyphs

In 2017, the Canadian government nominated eight places as candidates for future designation as a UNESCO World Heritage Site. One of those is Qajartalik, located off the mainland coast of Nunavik, where more than 180 anthropomorphic faces were carved into soapstone outcrops. Although Qajartalik has not been precisely dated, stylistic comparison of its faces with better-dated mobiliary "art" indicates that Qajartalik was created by Dorset carvers, possibly during the latter part of the Dorset era (1500–700 BP). Coinciding with the Mediaeval Climatic Anomaly, this was a dynamic period in the Eastern Arctic marked by large-scale population movements, seasonal communal gatherings, and a widespread artistic tradition involving both naturalistic and abstract representations of animals and humans. Within this cultural world, Qajartalik, and a much smaller petroglyph site relocated in 2019 on the mainland, remain unique as the only known examples of non-portable Dorset "art." This presentation discusses a new programme of collaborative and community-initiated research at and around Qajartalik which seeks to better understand why the petroglyphs may have been created, their place within the Dorset world, and how Qajartalik continues to be experienced within the contemporary North.

Ryan, Kimberley (Bureau of Land Management)

[92]

Discussant

Ryan, Susan [149] see Throgmorton, Kellam

Ryden, Ronald, Michael Stubing (Jacobs Engineering) and Mark Chenault (WestLand Resources Inc.)

[79]

Assessing the Utility of Excavators and other Heavy Equipment for Archaeological Excavation

Archaeologists conducting long-term data recovery excavations for the South Mountain Loop 202 Freeway project in Phoenix, Arizona used large excavators (track hoes) to remove the plow zone and overburden from above prehistoric features at several sites. After extensive analysis, the excavators proved to be faster, more efficient, more cost effective, and, in the hands of an experienced operator, as precise as backhoes for uncovering features in plan view. The excavator was especially useful in exposing linear canal features and the lateral canals that branched from them, leading to the discovery of gridded, prehistoric field cells dating to the Hohokam Sedentary period. The track hoe was also efficient at uncovering other common features including pithouses, earth ovens, and even delicate features. With this study, we provide quantitative data showing the increased efficiency, including a cost comparison, of these types of heavy equipment for archaeological excavation.

Rye, Elayne [8] see Dozier, Crystal

Sabatke, Stephen (SWCA)

[44]

Discussant

Sabloff, Jeremy (Santa Fe Institute)**[102]***Discussant*

Sabo III, George [107] see Lockhart, Jami

Sabo III, George [166] see Trubitt, Mary Beth

Sadori, Laura [234] see Gavériaux, Fanny

Safronov, Alexander**[164]***Wars of the Western Maya Kings: Military Conflicts in Lacandon Selva at the Turn of the Seventh–Eighth Centuries*

The last quarter of the VII century was marked by the intensification of military and political struggle in the Ususmasinta Basin. Loss of control over the Western Lowlands by Kaanu'l power at this time led to wars between the largest political centers of the region—Piedras Negras, Palenque, Yaxchilan, Tonina and Saktz'i. The Lacandon Selva (Chiapas Piedmont) area in southwestern part of the Usumasinta Basin became the epicenter of their political interests, since this area opened access to the control of the important Usumasinta communication route. In current presentation, we will try to reconstruct some problematic episodes of these wars based on reviewing of epigraphic sources from Tonina, Piedras Negras and so called "Bonampak area"—complex of unprovenance monuments including inscription of Saktz'i kings, and its correlation with new archaeological data. As the result, we will show a more complete picture of military and political events at this period. Based on GIS methods we want to model main communication routes and approximate political boundaries of Western Maya kingdoms and to describe the logic of the military struggle in the area of Lacandon Selva on the south of Usumasinta Valley in the Late Classic period.

Sahib, Mohammed [252] see Klenck, Joel

Sakai, Sachiko (California State University, Long Beach)**[237]***Settlement Patterns of the Early Occupation among the Virgin Ancestral Puebloans during the Basketmaker III Period in the American Southwest*

The ultimate goal of this study is to gain a better understanding of the settlement patterns among the Ancestral Puebloans who lived in the marginal environment. The traditional model of settlement patterns among the early population in the American Southwest suggests they had relatively mobile lifeways with limited agricultural practices. This leads to the proposition that the habitation during this time was for a short term and that limited energy was expended to construct structures. In this paper, I would like to investigate if this traditional model explains the settlement patterns at Mt. Trumbull near the northwestern Grand Canyon area. A Basketmaker III pithouse site, 71 ASM, was chosen for the excavation following previous GPR survey to answer several questions, such as the length of the occupation, seasonality of the site use, and the energy devoted to construction. During the previous two summers, the excavations showed that a five-meter-diameter pithouse was dug into the limestone bedrock, which suggests a relatively large amount of energy was expended. Furthermore, a hearth on the pithouse floor suggests that the house was likely used year-around. OSL dates of more than 30 ceramic artifacts from various layers suggest that the pithouse was occupied multiple times.

[237]*Chair*

Salas Bautista, Eva [101] see de la Rosa, Yuri

Salazar, Lucy and Richard Burger (Yale University)**[182]***The AMS Dating of the Karwa Textiles and Its Implications for the Spread of the Chavin Cult*

The discovery of the Karwa textiles on the shores of the Bahía de la Independencia half a century ago provided strong evidence of the spread of Chavin cult from the northern highlands to the south coast sometime during the Early Horizon. The development of AMS dating provides the opportunity to directly date the textiles themselves and toward that end, a sample of these textiles from the Yale University Art Gallery were analyzed along with a sample of Chavin weavings also believed to come from the south coast. The resulting measurements confirm that textiles date to between 700–400 cal BC, dates contemporary with the Janabarriu Phase at Chavin de Huantar. This result, while consistent with earlier estimates based on relative dating, has important implications for understanding the trajectory of the center at Chavin de Huantar and the timing of its pan-regional influence.

Salazar Chávez, Víctor (George Washington University) and Jeffrey Blomster (George Washington University)**[235]***Quotidian and Ritual Use of Maize at Early Formative Etlatongo, Oaxaca, Mexico*

Recent research on subsistence systems in Early Formative (1600–900 BCE) Mesoamerican communities contest longstanding concepts linking the growth of early sociopolitical complexity with full-time agriculture. Lowland-focused studies have introduced mixed non-agricultural models in coastal regions that were able to support both sedentary groups and much larger complex societies. While these studies bring important challenges to long-held models of the primacy of full-time agriculturalists in early

sociopolitical complex societies, their applicability beyond the lowlands to contemporaneous societies lying in different environmental settings remains understudied. In this paper, we present the case study of the Early Horizon (1400–1000 BCE) highland community of Etlatongo in the Mixteca Alta of Oaxaca. Analysis of a large and well-preserved charred macrobotanical collection sheds light on maize-based diets and the role of this important crop in both subsistence and early public rituals. Compared to contemporaneous lowland societies, maize constituted a major part in the diet of ancient villagers at Etlatongo, as well as an inherent component in communal ceremonies, setting the grounds for the latter maize iconography so commonly associated with the political economy of Mesoamerica.

Salazar Chávez, Victor [211] see Blomster, Jeffrey

Saldana, Melanie (California State University, Los Angeles) and James Brady

[137]

Archaeology Confronts the Constructed Subterranean: Reviewing a Half Century of Ambivalence

Archaeology has had an ambivalent relationship with the constructed subterranean starting with the cave beneath the Pyramid of the Sun at Teotihuacan. Geologist Federico Mooser mistook the cave for a lava tube, a mistake that stood for 15 years. Good and Obermeyer investigated the cave at Oxtotipac and recognized that the cave was man-made; Sanders and colleagues, however, labeled the Oxtotipac caves as quarries even though the heavy artifact concentration appear to be inconsistent with that function. John Fox also recognized that the cave at Utatlan was constructed, was over 100 m long, and terminated under the central plaza but appears not to have considered it important enough to map. These and other examples finally came to be accepted in the new millennium. In the last decade cave archaeology has vastly expanded the scope of the constructed subterranean. These will be discussed in the context of the field's continuing ambivalence.

Saldaña, Gabriela, Tia Watkins (University College London), Rosamund Fitzmaurice (University College London), Julie Hoggarth (Baylor University) and Jaime Awe (Northern Arizona University)

[178]

Analysis of the Built Environment of the Group B Acropolis at Baking Pot: Results of the 2019 Field Season

The ceremonial center of Baking Pot, Belize is one of the longest occupied sites in the Belize River Valley, starting in the Late Middle Preclassic (600–300 BC) and spanning through the Terminal Classic (AD 750–900/1000) period, with some evidence of reoccupation during the Late Postclassic (AD 1200–1521) period. Considerable research efforts over the past three decades by the Belize Valley Archaeological Reconnaissance project (BVAR) have contributed significantly to our understanding of the Baking Pot site core and its hinterland. In this poster we present the results of recent excavations at Structure B7, a large audiencia (an elongated multi-roomed structure) that provided the primary formal entrance into the private palatial compound of Group B. Research in the 2019 field season focused on understanding the organization and spatial layout of elite monumental architecture based on questions regarding accessibility and interaction between elite agents within such compounds. This poster reports on the field methods, data collection, and analysis of the architecture and materials recovered during the 2019 field season.

Salgado, Silvia [168] see Steinbrenner, Larry

Samson, Alice [239] see Martinez Milantchi, Maria Mercedes

Samuels, Amanda [72] see Yakabowskas, Dana

Samuelsen, John (University of Arkansas)

[222]

An Isotopic Assessment of Late-Prehistoric Interregional Warfare in the South-Central United States

There is a great need to develop better methods to identify and quantify warfare when it occurs without accompanying written documentation, and to consider alternative explanations of data. This study tests if late-prehistoric Caddo communities in southwest Arkansas were committing large-scale acts of violence against neighboring regions. Concurrent archaeological evidence of increased violence in the Southern Plains and the Eastern Woodlands may reflect increasing tensions between regions. Alternatively, unusual burial treatments often attributed to warfare might indicate alternative practices involving transport of partial skeletal remains for special burial at important regional centers. Previous research has suggested that deposits of skulls and mandibles at the Crenshaw site in southwest Arkansas were victims of warfare from other regions, but research based on Sr isotopes suggested they were local burials. This study recognizes the weakness of using Sr isotope data alone and uses Pb isotopes in combination to evaluate the geographic origin of the remains. In order for this to be accomplished, a clearly developed method for constructing an isotopic background for Pb isotopes was needed. This study used prehistoric animal teeth to construct a background for southwest Arkansas and other regions in surrounding states to define and demonstrate the method.

Samuelsen, John [107] see Hammerstedt, Scott

San Román, Manuel (Universidad de Magallanes), Flavia Morello Repetto (Universidad de Magallanes), Jimena Torres (Universidad de Magallanes), Carolina Belmar (Universidad de Chile) and Omar Reyes (Universidad de Magallanes)

[177]

San Juan 1 Site: New Archaeological Information for Marine Hunter-Gatherers from the Middle-Late Holocene of Chiloé Island,

Chile (42° S)

The archaeological study of San Juan 1 site, located on the interior coast and the central portion of Chiloé Island, is presented. The site is located next to the San Juan River and on a paleobeach formation adjacent to the modern coast plain between 10 and 3 m above present-day sea level. Excavations in this large archaeological shellmidden generated a rich assemblage of faunal and artifact information. The results indicate that this is a shellmidden produced by successive human occupations of hunter, gatherer and fisher groups during the Holocene, and that they were carrying out multiple domestic activities with a main trend of subsistence practices based on marine resources. Lithic materials show an outstanding technology dominated by bifacial façonnage knapping of Chaitén volcano obsidian and other minor artifacts as used boulders with crushing and abrasion activity marks. Radiocarbon dates range from 5990 cal years BP to modern. The settlement pattern, the lithic industry and the exploited resources represent the characteristics and background information of the canoe groups of the northern archipelago of Patagonia. Acknowledgement: Grant FONDECYT 1170726.

San Román, Manuel [119] see Morello Repetto, Flavia

San Román, Manuel [61] see Reyes, Omar

Sanchez, Fabiola (Mensabak Project), Joel Palka (University of Arizona State) and Josuhé Lozada (INAH)

[204]

Women's Hands in the Rock Art of Mensabak Lake, Chiapas, Mexico: An Approach from the Agency Theory

Representations of hands in rock art is a polysemy motif registered among different archaeological sites in Chiapas, Mexico. Painted hands are a recurrent representation in the cliffs of Mensabak Lake in the Lacandon Rainforest, where these paintings were made by both positive and negative techniques. This paper will discuss the semantics of hand representation in rock art and will compare the results of the study with present day Maya Lacandon. The team used a participant methodology to measure hands of men and women from different ages to identify the sex and age range of the people who made prints on the cliffs. Those results indicated that 22% of the hand prints in the rock art in Mensabak Lake were made by young women. The action and participation range of young Maya women used in rituals in the sacred cliffs has been made using the human agency theory. Parallel to this research, we will use the ethnographic data gathered to contrast Maya Lacandon women's role in current rituals performed in the shrines in the surroundings of this sacred lake.

Sánchez de la Torre, Marta (PPVE, Universidad de Zaragoza), Xavier Mangado (SERP, Universitat de Barcelona), François-Xavier Le Bourdonnec (IRAMAT-CRP2A [UMR 5060]), Bernard Gratuze (IRAMAT-CEB [UMR 5060]) and Mathieu Langlais (PACEA [UMR 5199])

[30]

Lithic Procurement at Montlleó Open-Air Site (SW Europe): Tracing Past Human Routes

Montlleó open-air-site (Prats i Sansor, Catalonia) is located in one of the largest high-attitude valleys in the Pyrenees, the Cerdanya Valley, in SW Europe, at 1144 m asl. The site is a natural road to cross the Pyrenees in the Eastern part. The site, discovered in 1998 and excavated since the 2000 by a multidisciplinary research team from the SERP (University of Barcelona), was occupied by hunter-gatherer groups during the Upper Palaeolithic. The research works have detected so far at least two different chronocultural occupations: one possibly dated from the Badegoulian (16900±110 BP and 18860±80 BP non cal) and another from the Lower Magdalenian (15440±80 BP and 15550±140 BP non cal). Lithic raw materials recovered at Montlleó are diversified by the presence not only of exogenous rocks, as chert, but also by local rocks, like rhyolite, quartz, quartzite and lydite. The archaeopetrological study of the recovered lithic set has comprised micropalaeontological, petrographical and geochemical analyses (energy dispersive X-ray fluorescence and laser-ablation inductively coupled plasma mass spectrometry). Results have allowed determining several origins for rocks, showing a great knowledge of the Pyrenean territory and making evident the existent relation between both Pyrenean slopes during the Late Glacial Maximum.

Sánchez-Miranda, Guadalupe [79] see Krug, Andrew

Sanchez Morales, Lara [206] see Quiroz, Carlos

Sánchez Mosquera, Amelia and Juan Miguel Kosztura (Universidad Nacional de Colombia)

[257]

Camellones y tefras en el subsuelo de Quito: Evidencias de cultivos y dinámicas temporales

Recientes trabajos en torno a la construcción del Metro de Quito han permitido identificar 23 evidencias de campo elevados (camellones) en el subsuelo del trazado. Mediante la combinación de estudios geológicos, fechamientos de suelos, análisis de fitolitos y análisis de espacio se propone reconstruir la historia del entorno de la actual capital del Ecuador para el/los momentos en los que esos camellones fueron productivos. Estos, los primeros análisis de fitolitos de camellones del subsuelo quiteño también nos permiten entender la manera en la que se alimentaban los antiguos habitantes, los cambios de cobertura vegetal y la dinámica poblacional.

[257]

Chair

Sánchez Torres, Edgar Octavio (Escultor y resturador independiente) and Rebecca González Lauck (INAH Tabasco & MNA)

[191]

Nuevas observaciones sobre el trazo y manufactura de algunas esculturas olmecas de La Venta, Tabasco

En el 2012 se realizó una revisión del corpus escultórico procedente de la zona arqueológica La Venta, en la costa del golfo en el sureste mexicano. El objetivo principal fue documentar el estado de conservación de las esculturas labradas en estilo olmeca expuestas o resguardadas en cinco recintos del Instituto Nacional de Antropología e Historia y de lo que ahora se denomina la Secretaría de Cultura del gobierno del estado de Tabasco. Este estudio permitió observar las piezas como pocas veces en el pasado e identificar algunas marcas enigmáticas en las piezas. Con conocimiento de primera mano del proceso de esculpido por el primer autor, se reconocieron algunas marcas que brindan nuevas luces sobre el proceso de labrado y manufactura. Por otro lado, en otras piezas que se pensaban “mutiladas” en procesos rituales, se vislumbraron nuevas posibilidades para entender su concepción y posibles funciones.

Sandeford, David (School of Human Evolution and Social Change, Arizona State University) and José Lobo (Global Institute of Sustainability, Arizona State)

[26]

Settlement Scaling Theory and Political Order in the Prehistoric Oaxaca Valley

This paper explores the economic implications of the emergence and collapse of political order in the prehistoric Oaxaca Valley. We analyze a large-scale archaeological dataset documenting three millennia of political, infrastructural, and socioeconomic development by combining two lines of complex systems analysis, settlement scaling theory and the complex network model of human societies. While settlement scaling theory has had remarkable success predicting and explaining properties of ancient and modern urban systems, in the Oaxacan case and others it has been unable to explain empirical regularities which appear to have a regional or sociopolitical scope. The complex network model of human societies states that populations are structured as discrete, hierarchical, self-similar, modular social networks. This structure is particularly well documented for the settlement networks and sociopolitical structure of primary states such as Zapotec state. We use this insight into the complex network structure state societies to extend settlement scaling theory to a regional or political scope. When the predictions of settlement scaling theory are extended to account for the complex network structure of the Zapotec state several empirical problems are resolved. Unlike previous work, our analysis makes the assumption of a political order explicit and documents its effect on economic growth.

Sanders, Mariana

[71]

Chair

Sandgathe, Dennis [36] see Abdolazadeh, Aylar

Sandman, Larry [63] see Herzner, Louis

Sandweiss, Daniel (University of Maine)

[23]

The Central Andean Coastal Archaic?

Some archaeologists working in the Central Andes use the term “Archaic,” though it is unclear exactly how to apply Willey-Phillips’s definition (a stage of reduced mobility and intensified resource procurement before the advent of agriculture) along the coastal plain. Specialized, intensive fishing dates from the Terminal Pleistocene, but at least some fishing sites were seasonal. Should the Archaic begin with these earliest sites? Domesticated plants appear by the start of the Holocene, but are not accompanied by ceramics or obvious indicators of sedentism. Small-scale monumental architecture is present by 7000 cal BP and large monuments start between 5000 and 6000 cal BP. The earliest canals date to about 5000 cal BP and shortly thereafter large-scale irrigation is necessary to explain the amount of crops and the size of sites, at least in the Norte Chico area north of Lima, Peru—sites that have all the hallmarks of sedentism although the economy was based on a combination of fishing and farming. And yet pottery does not occur south of modern Ecuador until after ~3600 cal BP. There is also considerable latitudinal variation in the record. Here, I consider this record in assessing the utility of the Archaic concept for the region.

Sandweiss, Daniel (University of Maine)

[59]

Discussant

Sandweiss, Daniel [8] see Landazuri, Heather

Saniel-Banrey, Maria [63] see Tankersley, Kenneth

Santana Sagredo, Francisca (Universidad de Antofagasta), Chris Harrod (Universidad de Antofagasta), Petrus Le Roux (University of Cape Town) and Mauricio Uribe (Universidad de Chile)

[61]

Camelid Herding in the Atacama Desert (Northern Chile): New Evidence Based on Stable and Radiogenic Isotope Analysis

Pastoralism in the Andes has mostly been described as an activity that occurred in the puna and altiplano. So far, there is a considerable lack of information on diet reconstruction and mobility of camelids in northern Chile. This work presents new stable carbon, nitrogen, oxygen and radiogenic strontium isotope results for camelid samples with the aim to evaluate pastoralism practices in coastal and inland sites from Northern Chile dating from 1000 BC–AD 1470. A total of 135 samples were analysed

including bone collagen, tooth enamel, fibers and textiles. Results show chronological differences on the consumption of C₃ and C₄ plants, while $\delta^{15}\text{N}$ values suggest ingestion of plants affected by the aridity effect or use of fertilisers. Values of the Sr isotope results are associated with the lowlands. We conclude camelid herding was a common practice in the lowlands of northern Chile. The implications of this study are considerable as the enriched values in ¹³C and ¹⁵N observed in the camelids will have a direct impact on ancient human diets.

Santasilia, Catharina (University of California, Riverside)

[168]

Ethics and INAA: Early Formative Movement

In this paper I am addressing the ongoing debate about incorporation of objects without provenance, including the ethics behind excluding the material, as well as methods available to potentially establish provenance. This paper will introduce the impact INAA has on our understanding of Tlatilco and how it has helped establish new data potentially resolving the site's relations to its contemporaries.

Santiago, Louis [178] see Fedick, Scott

Santillan Goode, Julianna (University of California, San Diego), Matthew Sitek (University of California, San Diego), Margaret Schoeninger (University of California, San Diego), Paul Goldstein (University of California, San Diego) and Arianna Garvin (University of California, San Diego)

[61]

Paleodiet Reconstruction in the Tiwanaku Periphery: New Stable Isotope Data from the Locumba Valley, Peru

This paper explores the relationship of diet to Tiwanaku sociopolitical organization with new data from a Tiwanaku cemetery at the site of Cerro San Antonio (L1) in the Locumba Valley, a frontier context in southern Peru. Extensive survey of the valley conducted by Proyecto Arqueológico de Locumba from 2015–2019 suggests that Tiwanaku populations in the Locumba Valley practiced food production that had complex connections to the Tiwanaku core. The present study discusses the first stable isotope analysis of Tiwanaku individuals from the Locumba Valley, with data on bone carbonates from 8 individuals analyzed at the University of California San Diego's (UCSD) Paleodiet Laboratory. Results will help to better understand the relative proportion of lower elevation maize consumed by the peripheral Locumba Tiwanaku population. The data will be contextualized via comparison with published paleodiet stable isotope data from the Moquegua Valley and published paleodiet stable isotope data from the Tiwanaku core.

Santillan Goode, Julianna [267] see Garvin, Arianna

Santoro, Calogero [171] see McRostie, Virginia

Santoro, Calogero [74] see Ugalde, Paula

Santos, Amanda Grace

[231]

Cultural Heritage and Rural Archaeology in the Alentejo, Portugal: A Case Study

The collaboration of Cultural Heritage Management and archaeology allows the data to be more accessible to the wider population, now as well as in the future. The Direcao-Geral do Patrimonio Cultural (DGCP), established in 2012, oversees the many heritage projects within the Portuguese landscape. The DGCP lends itself as a model through which many local municipalities, and even entire countries, can cultivate their network of heritage projects and archaeological sites together. Extensive travel throughout the Alentejo, participation in two archaeological digs in the area, and contact with local archaeologists revealed the multifaceted reality of cultural heritage management projects. Implemented correctly, these projects can overcome limitations and bridge the gap between the past revealed by archaeology and the reality of the cultural landscape today. A number of villages excel in bringing attention and support to their heritage in the form of small museums. Their success supports the need of a wider focus on cultivating heritage projects with the goal of a comprehensive narrative that successfully connects each municipality with local museums.

[231]

Chair

Saper, Shelby (University of Oregon), Richard Rosencrance (University of Oregon Museum of Natural and Cultural) and Katelyn McDonough (Texas A&M University)

[66]

Assessing Typology of Pre-Mazama Corner-notched Points in the Northern Great Basin

Some researchers support a "long-chronology" for corner-notched points in the Great Basin, with these points dating to as old as 8,500 cal BP. Opponents support a "short-chronology," suggesting corner-notched points are younger than 5,000 cal BP. This debate suffers from the use of a variety of typological schemes, regional variability, and lack of buried sites. Corner-notched projectile points exhibiting atypical morphology from traditional types have been found in a well-stratified context associated with cultural features at the Connley Caves, Oregon. In this poster, we apply a variety of typological schemes to these points and others found in contexts below Mount Mazama tephra (ca. 7630 cal BP) in Oregon to provide information on the typology and age of pre-Mazama corner-notched points in the northern Great Basin.

Saracino, Jennifer (Flagler College)**[127]***Placing Tlaloc: Indigenous Markers of Sacred Place in the Uppsala Map of Mexico City (ca. 1540)*

The Mapa Uppsala (ca. 1540), the earliest known map of Mexico City painted after Spanish conquest, presents the urban plan of the island city and its environs, along with depictions of indigenous inhabitants and place glyphs. Scholars generally concur that it was made by indigenous artists, however, previous art historical considerations of the Mapa Uppsala emphasize the artists' wholesale adaptation of European-style naturalistic landscapes in their representation of the city and its environs. However, the landscape is also represented and defined by almost 200 native place glyphs that designate indigenous conceptualizations and perceptions of space and place. This paper examines various pictorial and glyphic markers on the map associated with the Tlaloc ritual complex. By analyzing these sites of prehispanic ritual significance, this paper aims to complicate previous characterizations of the artists' adaptation of European-style landscapes by demonstrating instances where the pictorial evidence points toward continued associations with the deity Tlaloc in the cultural landscape. Through this analysis, this paper explores how the interaction among the map's various features—extensive and detailed road network, city plan, and prehispanic deities—conveys a uniquely indigenous perspective on Mexico City's early colonial landscape.

Sarathi, Akshay (University of Wisconsin, Madison), Jonathan Walz (SIT-Graduate Institute) and Laure Dussubieux (Field Museum)**[249]***The Trade and Use of Glass Beads at the Site of Unguja Ukuu, Zanzibar (Seventh–Eleventh Centuries CE)*

Excavations at the site of Unguja Ukuu, Zanzibar in 2018 revealed the extensive use of glass beads through the occupation sequence of the site. This presentation summarizes continuity and change in the glass bead trade at the site during different occupation sequences. Further, the trade in, modification, and use of glass beads at the site must be placed in the larger context of beads of other materials found at the site, and of other imported items that originate in the regions from which these beads arrived. This larger context reveals that imported glass beads were likely prestige goods of not insignificant value, and that they were part of a vibrant economic system that tied East Africa to the remainder of the Indian Ocean world. The social, cultural, political, and economic contexts of the regions where these beads were manufactured will also be examined in an effort to understand how oceanic trade networks transcended local political and social change while influencing them in fundamental ways.

Sassaman, Kenneth (Univ of Florida)**[23]***The End Is Not Near: An Archaic World-Renewal Perspective on Our Own Future*

If measured by the grandeur of Poverty Point, the Archaic Period in the American Southeast went out with a bang. In the centuries leading up to its abandonment, Poverty Point was the locus of world renewal that united communities across much of the region. This network of persons was structured by places of cosmological import and the pathways that connected them. Although human access to places of this sacred geography (e.g., mounds, caches, cemeteries) became difficult as climate grew increasingly unpredictable, the extant network of persons afforded opportunities for displacement, relocation, and reorientation to become what archaeologists describe as the Early Woodland. Through the lens of world renewal, what appears to be the end is just another beginning, one predicated on reconciliation between the space of experience and the horizon of expectation. From this history come useful insights on our own future of population displacement and resettlement.

Sassaman, Kenneth (Univ of Florida)**[70]***Discussant***Sattler, Robert (Tanana Chiefs Conference), Carrin Halfman (University of Alaska, Fairbanks), Joshua Reuther (University of Alaska, Fairbanks), Michael Grooms (University of New Mexico) and Robert Bowman (Tanana Chiefs Conference)****[202]***Late Holocene Occupation of the Rampart Canyon, middle Yukon River, Alaska*

Rampart Canyon is a bedrock constrained corridor between broad lowlands along the middle reach of the Yukon River basin in central Alaska. The river breach is a focal zone for annual migrations of pacific salmon to their spawning grounds in the headwater region of the Yukon River drainage. Froehlich Rainey's survey of the region in the 1930s has recently been supplemented with subsurface testing at the Rampart Dune site, the first pre-contact site to be systematically tested in the Rampart Canyon corridor. Perched on an overlook topographic setting, the site is a complex of ground caches across a relict dune field adjacent to the main channel of the river. Multiple pit features of varying sizes and morphologies traverse several vegetated sand ridges. Ground-penetrating radar imagery has guided data recovery of well-preserved birch-bark and salmon remains in the largest pit feature (c. 1400–900 cal BP). A buried cultural zone in adjacent eolian deposits dates to c. 1150 cal BP. The Rampart Dune site is the only known multicomponent, stratified archaeological locale in the middle reach of the Yukon River. An associated, diverse fossil insect assemblage provides supplemental environmental proxies.

Saucedo, Alfredo [150] see Carballo, David

Saul, Julie [53] see Drake, Stacy

Saul, Julie [178] see Godhardt, Ava

Saule, Jolyane**[17]***Bifacial Tool Types Variability during the Late Paleoindian Period in the Eastern Townships, Québec*

Kruger 2 (BiEx-23) is located on a terrace overlooking the Saint-Francis River in the Eastern Townships. The site bears the distinctive material of the Plano tradition with over 890 tools collected (and almost 190 000 debitage elements). Several Plano sites, including Fortier (BkEu-3), Gaudreau (BkEu-8) and Cliche-Rancourt (BiEr-14), have been found in the region, but none have the same material density as Kruger 2. While seriation of diagnostic objects for the Western Plano tradition is well-defined, its Eastern counterpart is still poorly understood and documented. The uniqueness, in terms of variety in tool types, raw material used and quantity of artifacts, of the site makes the analysis of the tool assemblage indispensable for the understanding of the Eastern Plano tradition. The goal of this research is to employ geometric morphometrics and traditional attributes to document the morpho-functional tool types found on Kruger 2. The project focuses on form and format variations to distinguish the main morpho-functional categories: projectile points (Agate-Basin and St-Anne-Varney), drills, preforms, and bifaces. A subsidiary question is also discussed: to which extent raw material choice influences the metric characteristics of tools?

Savenkova, Tatyana [173] see Kim, Alexander

Sawchuk, Elizabeth [171] see Hildebrand, Elisabeth

Sawyer, Johann [166] see Heep, Nathan

Sawyer, Johann [47] see King, Adam

Scaffidi, Beth (Arizona State University), Natasha Vang (Vanderbilt University) and Tiffany Tung (Vanderbilt University)**[61]***Early Childhood Diet and the Institutionalization of Social Identity and Social Inequality: Stable Isotope Analysis of Sequentially Forming Human Tissues at the Cemetery of Uraca, Lower Majes Valley, Peru (ca. 200–750 CE)*

Subsistence practices are not just borne out of necessity—food consumption is a conscious symbolic or logistical choice reflecting various aspects of social identity. The foods infants are fed and what children and adults eat are linked to social class, occupation, gender, or other social categories. Stable isotope analysis of apatite ($\delta^{13}\text{C}$) and collagen ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$) from incrementally-developing tissues (first, second, and third molars, and bone) are examined in a mortuary population from the Lower Majes Valley (Arequipa, Peru) dating to just before and during the era of Wari imperial dominance (ca. 200–750 CE) to understand how childhood diet restricted or broadened dietary options during later childhood, adolescence, and adulthood. Isotope ratios ($\delta^{13}\text{C}$) from first molars show that injured, elite men consumed a greater relative proportion of prestigious C_4 foods like maize during infancy compared to women and the uninjured, a pattern that continued during middle childhood and adolescent years. Isotope ratios ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$) from bone collagen show these dietary differences diminished by adulthood and the years immediately preceding death. Elite boys seem to have been groomed for adult roles by being fed distinct childhood diets that increased their access to high-status foods throughout much of their lives.

Scaffidi, Beth [243] see Dean, Jake

Scarborough, Vernon (University of Cincinnati)**[33]***Discussant*

Scarborough, Vernon [98] see Fladd, Samantha

Schach, Emily (University of California, Santa Cruz) and Jane Bulkstra (Arizona State University)**[260]***Feeding the Dead at Chiribaya Alta: A Comparative Analysis of Mortuary Practices*

Andean mortuary practices reflect aspects of individual and cultural identities as well as broader attitudes toward the dead. Multiple studies at Chiribaya Alta have identified various social identities possessed by the dead. Few, however, have addressed the broader cultural practices and attitudes toward the dead reflected in Chiribaya Alta mortuary contexts and their relationship to other Late Intermediate Period groups within the Moquegua Valley. The inclusion of foods and eating utensils within graves at Chiribaya Alta suggests that the practice of “feeding the dead” was an important element to funerary rites. In this paper we examine the presence of eating implements and foods within graves at Chiribaya Alta ($n=307$) to consider their potential symbolic meanings within funerary practices. A comparison of food related mortuary practices between Chiribaya and other LIP groups in the Moquegua drainage, will be used to understand relationships during this time period. Thus, this study will allow for a consideration of the multiple ways in which the act of feeding the dead fulfills the mourner’s obligations to the dead, social identities at Chiribaya Alta, and relationships between archaeologically-identified LIP cultures.

[260]*Chair*

Schach, Emily [242] see Blackman, David

Schach, Emily [260] see Birtell, Tabitha

Schach, Emily [5] see Wieland, Spencer

Schachner, Gregson [98] see Solometo, Julie

Schaefer, Benjamin [160] see Bowen, Corey

Schaefer, Jonathan (University of Missouri), Suzanne Eckert (University of Arizona), Jeffrey Ferguson (University of Missouri) and Deborah Huntley (TetraTech)
[203]

Obsidian Use and Regional Interaction in the Lion Mountain Community of West-Central New Mexico

The Lion Mountain Community of west-central New Mexico in the southeastern Cibola region is a large Pueblo III period aggregated community. Based in part on ceramic and architectural data, this community shares similarities with contemporaneous villages located in the Zuni Region to the west. The focus of this research is examining what interactions the Lion Mountain Community may have had with the broader Cibola Region and how this may have changed through time. Furthermore, how was outside interaction similar or different in comparison to nearby contemporaneous sites which have been hypothesized to represent different cultural affiliations. Building upon previous research, this study utilizes in-field ED-XRF analysis of obsidian to provide a narrow but precise indication of regional interaction for these sites.

Scham, Sandra

[159]

Archaeology and Ethnic Nationalism: The Desired Past of White Supremacists

In 2009, in the *Journal for Social Archaeology*, I defined the concept of a "desired past" as having, as its primary quality, the element of longing. In this sense, as I wrote then, longing is not nostalgia but a compelling belief that the desired past should have created a different present. I saw the desired past as a benighted, but generally benign, yearning for a history that never was. Since then, it has become apparent to me that the desired past also has some considerable overlap with what government and the media characterize as "extremist narratives." A case in point is the obsession of white supremacists with medieval history and archaeology. Medieval historians and archaeologists are, understandably, aghast at this development but few of them can really articulate why the oppressive Christian Western Europe of the Medieval Period should not serve as a model for other oppressors. This suggests that the study of the Medieval past, like other archaeologies rooted in western humanism, has not evolved an inclusive view of its past.

Schank, Cody [206] see Donn, Leila

Scharf, Elizabeth (University of North Dakota)

[78]

Archaeological Implications of a Late Holocene Pollen Record from the Florida Panhandle, USA

In late prehistoric times in the southeast U.S., researchers commonly find clear anthropogenic signals in pollen records. Vegetation responses to human disturbance typically involve decreases in arboreal pollen paired with increases in classic disturbance indicators, indicative of large-scale clearing of forested areas for cultivation. This study examines a pollen record from the western panhandle of Florida, where a sediment core from Clara's Bog was retrieved. Results show that this area was covered by relatively unchanging woodlands through the parts of the late Holocene represented in the core. In this presentation, results are compared and contrasted with other parts of the region and implications for interpreting the archaeology of the study area are discussed.

Scheinsohn, Vivian (INAPL-CONICET / University of Buenos Aires), Fabián Crespo (University of Louisville), Paula Miranda (Banco Nacional de Datos Genéticos, INAPL), Florencia Rizzo (INAPL-CONICET) and Denise Evans (INAPL)
[143]

Health and Disease in Northwestern Patagonia Hunter-Gatherers: Archaeological Models and Paleopathology

Paleopathology offers contributions about the influence of biological, socioeconomic, and cultural factors on the health of human societies on individual and population scales (Suby et al. 2016). For hunter-gatherers, Little and Blumler (2015) have suggested that population size, density, and high mobility influence the possibility that certain pathogens thrive. While the expansion of epidemics is limited, given the lower densities of hunter-gatherer populations and limited accumulation of waste, they are not safe from diseases since they would be subject to significant parasite loads as well as infections of bacterial or viral origin. They would also be more prone to zoonotic diseases (Froment 2001, Blurton Jones 2016) and/or accidents associated with close contact with animals (snakebites, hunting accidents, etc.) or rugged topographies (Scheinsohn and Matteucci 2004). Thus, we can generate expectations departing from archaeological peopling models (i.e., Borrero 1994–1995) assuming, for instance, that in a well-known area, hunter-gatherers would have a risk avoidance strategy regarding accidents. In this work, we present our expectations and results in this regard departing from the hypothesis that the distribution of paleopathological and traumatic indicators in hunter-gatherers from Northern Patagonia during the Late Holocene can be explained in terms of the Borrero (1994–1995) peopling model.

Schele, Elaine (Austin Community College)

[130]

The "Happy Accident" of 1970: Linda Schele Meets Moi, Merle, and Palenque

Linda Schele's cathartic visit to Palenque, Mexico in 1970 was transformative for her. She fell in love with the ancient ruins, the forest surrounding it, the people of Palenque and with the art and architecture of the site. She spent the next two years obsessively studying its architecture and its jungle, drawing the buildings and creating oil paintings of its rich foliage. (I will share photos and

scans of these drawings and paintings with the audience.) She was also teaching studio art at the University of South Alabama during that time and began a habit of returning to Palenque on scheduled breaks from her teaching job, bringing two to three art students with her on each trip. During her third year of study at the site, she became enamored with Palenque's iconography and with the mysterious inscriptions as seen in its stone carvings which culminated in her participation in the First Palenque Roundtable organized by Merle Greene Robertson in 1973. This is the story of Linda's awakening to the ancient Maya, to art history and to Maya epigraphy.

Scherer, Andrew (Brown University)

[209]

Discussant

Scherer, Andrew (Brown University), Charles Golden (Brandeis University) and George Kollias (Brandeis University)

[265]

A Comparative Perspective on Warfare in the Classic Maya Kingdoms of Piedras Negras, Yaxchilan, and Sak Tz'i'

Our understanding of Classic Maya warfare is, by necessity, biased toward the royal historical record. Carved monuments and painted murals and vases afford our best evidence for the timing, cause, and consequences of warfare and are rich in the symbolism and imagery attached to combat and violence. However, the royal historical record provides scant data pertaining to the broader social experience of warfare, including the nonelite experience of violence and the threat thereof. Here, the built environment—namely the form and distribution of fortifications and settlement—is our best line of evidence. In this paper, we compare new evidence for the distribution of defenses and settlement in the kingdom of Sak Tz'i' to our prior work on warfare in the polities of Piedras Negras and Yaxchilan and highlight how the social experience of war was highly varied across Maya kingdoms during the seventh and eighth centuries of the Late Classic period.

Scherer, Andrew [126] see Jimenez, Socorro

Scherer, Andrew [54] see Roche Recinos, Alejandra

Scherer, Andrew [202] see Schroder, Whittaker

Schier, Ben [55] see May, Alejandra

Schier, Ben [176] see Torquato, Melissa

Schleher, Kari (Crow Canyon Archaeological Center), Michelle Turner (Crow Canyon Archaeological Center), Mariana Lujan Sanders (University of New Mexico), Genevieve Woodhead (University of New Mexico) and Daniel Leja (Binghamton University, SUNY)

[149]

Lumping and Splitting: Design Variation on Mancos Black-on-white Pottery in the Central Mesa Verde Region

Within the central Mesa Verde region, the Mancos black-on-white pottery type is a bit of an enigma. Mancos black-on-white, produced from AD 920–1180, includes a wide range in variation in design and technology. During its production period, similar designs were used across the broader Ancestral Pueblo world. In the Cibola region, for example, the same range of designs were used, but Chaco archaeologists have separated out this range of design variation into four pottery types. The Crow Canyon Archaeological Center is currently working on the Northern Chaco Outliers Project, which is focused on the Lakeview Community, a cluster of four great houses. Mancos black-on-white is one of the most common pottery types recovered. Because of this prevalence and the vast amount of variation in the design and technology present on sherds of this type, Crow Canyon archaeologists have devised a detailed, attribute-based analysis conducted on a sub-set of the 40,000 sherds analyzed to date. The goal of this project is to test whether these differences in design and technology correspond to temporal or production group differences across the Lakeview Community, allowing for more fine-grained discussions of this variable pottery type. We will present preliminary results from our design study.

Schleher, Kari [147] see Schwindt, Dylan

Schloeman, Thomas [37] see Zhao, Yu-chao

Schloss, Rachel (University of Toronto)

[197]

A Comparative Study of Adobe Brickwork at Huaca Colorada and Tecapa

The Cañoncillo archeological complex in the southern Jequetepeque Valley of Peru is a sacred landscape distinguished by four neighboring ceremonial centers of Jatanca, Huaca dos Cruces, Huaca Colorada, and Tecapa. Although these centers reached their heights in distinct time periods across time span of 2,000 years, recent excavations in the complex have confirmed phases of overlapping occupation during the Middle Horizon and Late Intermediate Period. In particular, Swenson and Berquist (2017) hypothesize that the foundation of the site of Tecapa was contemporaneous with the last phase of occupation at the neighboring Moche pilgrimage center of Huaca Colorada. This idea suggests that Tecapa was built much earlier than previously assumed, as its architecture indicates strong highland influences, standing in stark contrast with Huaca Colorada's intrinsically coastal style of construction. This paper seeks to understand the relationship between the neighboring sites of Huaca Colorada and Tecapa through a comparison of their adobe brickwork. Brick form, recipe, and manufacture technology will be assessed from formal, geoarchaeological, and chemical methods of analyses to gauge whether the differences in architectural style at Tecapa and Huaca Colorada translate to distinct construction technologies underwriting the making of place and political subjects.

Schmader, Matthew (University of New Mexico)**[239]***First Contact, Pueblo Resistance, and Multiethnic Conflict on the Vázquez de Coronado Expedition of 1540–1542*

The immense expedition into the American Southwest led by Francisco Vázquez de Coronado from 1540 to 1542 was the first contact with outsiders experienced by many indigenous groups of the region. Coronado's entourage included Europeans from several countries, North Africans, blacks, and soldiers from numerous Mexican ethnic groups. Well over 2,500 people made their way into the Southwest and made contact with today's western pueblos, Rio Grande pueblos, and plains groups. Conflicts that occurred at several key sites reflect the multi-ethnic mix of the participants, along with mixed technologies and tactics. Ongoing research at one of the major expeditionary conflict sites, Piedras Marcadas Pueblo (located north of Albuquerque NM), has been funded by the American Battlefield Protection Program. The site contains a mixture of medieval European military technology, indigenous Mexican weaponry, and evidence of Pueblo resistance. Results of recent funded fieldwork highlight the roles of those involved and the material found at the battle site.

Schmidt, Kari (American Museum of Natural History)**[129]***Integrating Species Biology into Archaeological Studies: New Perspectives on Scarlet Macaws in Ancient Puebloan Cultures*

From time immemorial, birds have been an integral part of the human story, fulfilling various roles of economic, social, and spiritual importance. Among the most colorful and charismatic is the scarlet macaw, long venerated by ancient Puebloan cultures. High concentrations of feather artifacts and skeletal remains have been recovered through the region, more than 1,000 km from the species' native lowland habitats. Questions regarding the acquisition and maintenance of these Neotropical birds can be difficult to ascertain from a retrospective view of physical remains and artistic representations. Research into the natural history of wild populations can help fill this void and provide critical insights into our understanding of scarlet macaws in archaeological contexts. Recent work integrating archaeogenomic data with contemporary patterns of phylogeographic structure has identify southern Mexico and northern Central America as the most probably source of Puebloan macaws. Moreover, the high intrapopulation diversity of wild macaws contrasted with close genetic affinities recovered among ancient mitogenomes suggests the latter were bred locally, rather than continually harvested from native nest cavities. Ongoing research is employing simulation studies to model the historical distribution of scarlet macaw habitats and evaluate whether source populations were once found in closer proximity to Puebloan areas.

Schmidt, Morgan (Museu Paraense Emilio Goeldi) and Jennifer Watling (University of Sao Paulo)**[161]***Formation Processes, Fertility, Spatial Extent, and Carbon Content of Amazonian Anthropogenic Soils in the Upper Xingu*

Recent research in the Upper Xingu carried out in partnership with the indigenous Kuikuro community (Associação Indígena Kuikuro do Alto Xingu—AIKAX) has revealed that modified soils associated with remains of archaeological settlements and possibly with ancient cultivation areas may be much more extensive than previously thought. We are working to determine the fertility, carbon content, and overall spatial extent of these soils in the region. Ethnographic research with Kuikuro farmers has revealed the intentionality inherent in the formation of fertile dark earth soils (terra preta) around contemporary villages as well as the importance of ancient dark earth sites. Remote sensing and artificial intelligence will allow us to extend our ground-truth data to a wider area and determine overall extents of modified soils. Combining ethnographic, archaeological, microbotanical, environmental, and satellite data will allow more robust interpretations of landuse in the past.

Schmidt, Morgan [161] see Watling, Jennifer

Schmidt, Patrick [162] see Blessing, Matthias

Schmidt, Patrick [216] see Pargeter, Justin

Schmidt, Ryan [244] see Blohm, Tre

Schmitt, David [22] see Lupo, Karen

Schneider, Danielle**[91]***Discussant***Schneider, Joan****[89]***Discussant*

Schneider, M. Jesse [271] see Ardren, Traci

Schneider, Tsim [214] see Panich, Lee

Schnell, Joshua (Brown University)**[143]***Ancient Maya Dentistry: Documenting Therapeutic Dental Interventions Using Scanning Electron Microscopy*

The ancient Maya are often highly regarded for their skill in working with teeth, evidenced by longstanding traditions of filing and inlaying. In one study of nearly 500 dentitions, only 1 in 20 drilled cavities for inlays breached the pulp chamber, a considerable success rate suggesting a pervasive knowledge of dental anatomy. However, the study of aesthetic practices has overshadowed the study of the therapeutic aspects of ancient Maya dentistry, which have received comparatively little attention despite archaeological, iconographic, and textual evidence attesting to the importance of oral health. Following the identification of extracted teeth in a marketplace at the site of Piedras Negras in 2017, this project was initiated in order to better understand extraction techniques and other potential therapeutic interventions. It applies methods utilized by other studies of early dentistry, in turn, rooted in studies of dental microwear and fossil tooth studies, to study a large and diverse sample of ancient Maya teeth for the first time. Here I report on preliminary results of utilizing tooth replication techniques and scanning electron microscopy to detect and analyze microwear associated with lesions and defects in pathological teeth from a number of sites from across the Maya region.

Schoeninger, Margaret [61] see Santillan Goode, Julianna

Schofield, Abigail (Boston University), Luis Octavio Ruza (Association for the Study of Traditional Arts and), Luis Jaime Castillo (Secretary of Culture, Peru) and David Carballo (Boston University)**[242]***A Geospatial and Archaeoastronomical Analysis of Stone Monuments at Marcahuasi, Peru*

This project presents a geospatial evaluation of an ancient Andean landscape at the site of Marcahuasi, Peru, and its possible cultural significance using ESRI mapping and planetary software. Marcahuasi is a site with clear native Andean architectural remains, including habitational, storage, and burial structures, but also rock formations of debated origins and date. The goals of this project were to assess the geometrical and possible astronomical relationships between the stone monuments and to evaluate which, if any, were modified by human activity. These relationships will help determine if these monuments were created by a pre-Inca culture, reflective of Inca imperial influence, or wholly natural. Eleven of the rock formations, or markers, were assessed for astronomical relationships and evaluated for possible modification by human activity. While there are potential geometrical and astronomical relationships present for some monuments, the majority of the stone monuments did not present significant alignments with the sun during the summer and winter solstices. The lack of geometrical and astronomical relationships could indicate that these monuments are primarily natural in origin, though some aspects of the monuments may have been modified by humans. Future analysis will test for other astronomical alignments significant to Andean religion and cosmology.

Schollmeyer, Karen (Archaeology Southwest)**[122]***Chair***Schollmeyer, Karen (Archaeology Southwest)****[156]***Animal Remains in Communal Spaces and Ritual Activities in the Mogollon Area, AD 1000–1450*

Communal spaces are most often identified archaeologically through architectural features, but unusual artifact deposits also allow us to recognize spaces used for ritual practices and communal events. This research examines distinctive deposits of animal bones from structures in the Mimbres and upper Gila areas of southwest New Mexico from the Mimbres Classic through Cliff phase Salado periods (AD 1000–1450). Uncommon animal taxa are recovered in contexts such as purposeful floor deposits, floor feature fill, and deposits people left behind in partially filled-in rooms or other contexts where “ordinary” use of a structure had clearly ended. Some deposits include taxa associated with religious activities in Southwestern ethnographies, such as carnivores, raptors, and water birds. Other deposits are remarkable for containing numerous remains of animals not commonly found in archaeological contexts, such as fish. Additional taxa are most common as food remains, but are also sometimes associated with unusual contexts where people imbued them with other important meanings. Comparing distinctive animal bone deposits across time and space allows a more nuanced understanding of variation in the uses of communal spaces for ritual and important events.

Schollmeyer, Karen [122] see Chamalian, Zaynab

Schollmeyer, Karen [122] see White, Sean

Scholnick, Jonathan (Bucknell University)**[213]***The Decline of Small Farms in Pennsylvania during the Nineteenth and Twentieth Centuries*

This study traces the shifting agricultural strategies of households that lived and worked on a small farm in central Pennsylvania during the nineteenth and twentieth centuries. Small Pennsylvania farms shifted away from diversified farming during the nineteenth and early twentieth centuries due to the influence of modernization and post-war industrial farming practices. This was a period in which the number of farms and the farming population in rural America experienced a dramatic decline. The Keebler Farm in Lycoming County, Pennsylvania, was initially occupied during the 1830s, and it continued producing agricultural goods through the early twentieth century. Although parts of the farm have been continuously cultivated, land-use practices have dramatically changed the footprint and production of the farm, as parcels have been developed for residential properties, natural gas extraction, and most recently as a biological field station affiliated with a small liberal arts college. This study presents the results of the 2019 Lycoming College Field School.

Schroder, Verginica [159] see Turcanu-Carutiu, Daniela

Schroder, Whittaker (University of Florida), Charles Golden (Brandeis University), Andrew Scherer (Brown University), Timothy Murtha (University of Florida) and Omar Alcover (Brown University)

[202]

Reconstructing the Lakamtuun Kingdom: Aerial Remote Sensing and Reconnaissance along the Lacantun River, Chiapas, Mexico
Mayanists rely on emblem glyphs that link Classic period royal dynasties to places to reconstruct macropolitical structures across the Southern Lowlands. The Lakamtuun emblem glyph is one of many examples of a dynasty that has not yet been securely situated. The use of this title among the Lacandon Ch'ol during the Late Postclassic and Colonial periods as well as its persistence as a placename attached to the Lacantun River in Chiapas, Mexico suggests that the seat(s) of this kingdom lay somewhere along this major tributary of the Usumacinta River. In this paper, we combine methods of reconnaissance and excavation with remote sensing, primarily through the interpretation of lidar transects collected by NASA's Goddard Space Flight Center GLIHT system. By applying these methods between the archaeological sites of El Palma and Benemerito de las Americas, Primera Seccion we test various models of political organization of the Lakamtuun kingdom. We suggest that to the extent that "Lakamtuun" behaved as a toponym, the title was most likely used to refer to a series of shifting capitals, perhaps reflecting a strategy of political cycling that contributed to the resilience of the kingdom into the ninth century AD if not later.

Schroeder, Bryon (Center for Big Bend Studies - Sul Ross State University)

[101]

Late Archaic Maize in the Trans-Pecos of West Texas: Implications and Future Research

The recovery of late archaic maize from the Trans-Pecos, peripheral to the American Southwest, adds to an expanding list of primary crop acquisition by foragers who occupied arid regions. But it lacks clear demographic and settlement patterns diagnostic of this period from adjacent areas. Absent these key similarities, local researchers argued the early use of cultigens was superficial. But it is now clear the initial use of maize was both early and extensive across the Southwest, including the Trans-Pecos, with variable effects on settlement and subsistence. This has led to a debate on how to label this early period of cultivar use; is it an extension of archaic lifeways with limited food production, or the onset of an earlier agricultural period? What is clear is the use of maize preceding the formative period spans an appreciable area of diverse desert ecotones. Therefore, situating the role of maize as well as the initial introduction and intensity of use in the Trans-Pecos region is dependent on a larger context that includes all known examples. This talk explores the role of food production in the Trans-Pecos with new radiocarbon and dietary isotope data, adding to the larger discussion of early maize use.

Schroeder, Bryon [8] see Niquette, Richard

Schroeder, Eric (Texas Archeological Research Laboratory)

[169]

Status and Inequality during the Toyah Interval (1250–1700 CE): A View from the Mortuary Data

Much of the archaeological literature on the Late Prehistoric Toyah Interval views the populations of central and southwest Texas as highly mobile hunter-gatherers characterized by a relatively simple social organization that was more or less egalitarian and operating largely at the band level. However, early Spanish colonial records document the existence of social inequality with respect to gender, age, and status. These documents particularly note the existence of special status individuals who would travel long distances to group aggregation/trade fair sites to not only engage in trade, but to organize labor for the production of commodities and enlist support in raiding and warfare. This paper examines the subject of inequality and special status during the Toyah Interval through a synthesis of the available mortuary data with respect to patterns related to differential nutrition and health, grave goods, and evidence of violence.

Schroeder, Sissel (University of Wisconsin, Madison) and Samuel Munoz (Northeastern University)

[255]

The Paradox of Incommensurate Paleoecological and Archaeological Evidence

Drawing on Sullivan's considerations of human ecodynamics and settlement patterns, we examine paleoecological and archaeological evidence for human use and occupation of the floodplain of the American Bottom in west-central Illinois. Around AD 450, changes in the relative abundance of terrestrial pollen, particularly a rapid reduction in most arboreal taxa and an increase in non-arboreal taxa including plants that were part of the Eastern Agricultural Complex, offers evidence of extensive land clearance for farming of indigenous domesticates. However, there is a noteworthy absence of archaeological evidence for human occupation of the floodplain prior to AD 600. Development of a vast anthropogenic landscape in the American Bottom floodplain at a time when there are few traces of people living there and long before the emergence of elites and sociopolitical hierarchies has important implications for theories about the origins and spread of agriculture, the ecological impacts of a relatively small number of people, and the dynamic nature of the archaeological record.

Schuldenrein, Joseph (Geoarcheology Research Assoc)

[132]

"Bringing Up Sonny": The Trajectory of Pragmatic Archaeology in the Twenty-First Century

Heritage Management and CRM are currently entering early adulthood, a rite of passage wherein the why's, how's and where's of 106 are unquestioned. If development, preservation, and legacy guided the profession's emerging stages (latter twentieth century) then climate change, disaster, war and sustainability have reconfigured today's priorities. It's a sign of the times. Sonny Trimble and partners have arguably guided this rite of passage. His projects chronicle a trajectory that grew stepwise with time. Technology at

the forefront of these projects provided templates for deeper knowledge of past economic and social systems. These afforded a window on future sustainability. Our profession can, is, and must move to relevance with visions derived from more refined documentation of the past. We review Trimble's maturation, as he has systematically recast 106 to revive the heritage of disenfranchised minorities (African Burial Ground), recast light on Native American legacy (Carlisle Cemetery), extract meaning from the otherwise futile Iraq War (Mass Graves), and to stage a revival to America's economy during the Great Recession (VCP and Curation) in a manner reminiscent of FDR's New Deal. Yet Trimble's contributions remain incomplete and there are challenges ahead for him and the pioneering teams motivated by his vision.

Schultz, Julian (University of Michigan) and Tanya Peres (Florida State University)

[76]

Mollusks at Mound Field: Examining the Phylum's Role in Woodland Period Life on Florida's Big Bend

Prehistoric inhabitants of the Florida Gulf Coast subsisted on a variety of maritime resources. Investigations at the Woodland Period ring-midden site Mound Field (8Wa8) yielded substantial subsistence data regarding the dietary practices of its prehistoric inhabitants and the construction of the ring-midden itself. These data show a heavy exploitation of the eastern oyster (*Crassostrea virginica*) throughout much of the site's occupation, followed by a steep decline in the taxon's prevalence (based on MNI percentages). This poster will present the data, examine the factors that may have contributed to the drop-off, and discuss the implications it may have had to the ongoing inhabitation of the site.

Schurr, Mark (University of Notre Dame) and Madeleine McLeester (University of Notre Dame)

[124]

Isotopic Evidence for Protohistoric Field Locations in Northeastern Illinois

In the western Great Lakes region of the USA, late prehistoric and early historic indigenous fields are often difficult to investigate because their archaeological signatures are faint and easily destroyed. They have been identified largely via few remnants of ridged fields and historical records. With the majority of Indigenous fields destroyed, important aspects of cultivation remain ambiguous, especially the ecology of cultivated areas. In addition to archaeological indicators of field location, the choice of specific environmental settings (prairie, wetland, upland forest, etc.) can be encoded in the stable isotope ratios of cultigens. Stable carbon- and nitrogen-isotope ratios of maize kernels and wild plants from the Middle Grant Creek site (11WI2739), an early seventeenth-century village in northeastern Illinois, are used to better understand agricultural practices during one of the coldest periods of the Little Ice Age.

Schurr, Theodore [169] see Fleskes, Raquel

Schurr, Theodore [100] see Vilar, Miguel

Schwartz, Christopher (Arizona State University) and Kelley Taylor (Sacred Scarlets)

[129]

The Human Experience of Transporting and Raising Scarlet Macaws at Paquimé in Chihuahua, Mexico

Archaeologists have long known that birds figure into the lives of past humans in substantial ways. In the U.S. Southwest and Mexican Northwest, birds were valued as a dietary resource, for their ritual significance, as integral elements of indigenous cosmologies, and for the economic value of their feathers. This multifaceted significance is perhaps nowhere more clear than the site of Paquimé in northern Chihuahua where archaeologists have found evidence for the long-distance transport and local raising of scarlet macaws (*Ara macao*), despite a nearest natural habitat hundreds of kilometers to the south in eastern and southern Mexico. Though the macaws of Paquimé have been well-studied, traditional zooarchaeological approaches occasionally lose sight of how human-animal interactions shaped the daily lives of people in the past. This paper employs an archaeology of the human experience approach to examine what the experience of transporting and raising scarlet macaws would have been like for traveling tradespeople and the prehispanic inhabitants of Paquimé. We examine the biology and characteristics of modern scarlet macaws that would have necessitated specific treatments in the past and point out challenges and potential solutions for those that transported and raised them.

[129]

Chair

Schwarz, Kevin (ASC Group Inc.)

[55]

Iterative Temporal Hygiene and Bayesian Analyses of Large Radiocarbon Datasets: The Impact of Kernel Density Estimation upon Clarifying Temporal Relationships among Woodland-period Phases, Middle Scioto Valley, Ohio

The accumulation of radiocarbon dates for Scioto Valley Woodland-period sites has created a palimpsest, which inhibits chronological understanding of cultural change. The project iteratively integrates temporal hygiene and Bayesian analyses of large radiocarbon datasets from multiple sites, in an attempt to clean up problematic features of such datasets and provide for accurate archaeological inference. Temporal hygiene is applied and compared using three levels of stringency, in order to eliminate problematic assays, which result from early low-accuracy radiocarbon dates and non-optimal selection and reporting practices. Kernel density estimation (KDE) smoothing reduces statistical over-dispersion, which results from summing measurement imprecision and issues with the calibration curve. Bayesian analysis is built into the KDE routine, resulting in a more accurate analysis than otherwise possible. This degree of subtlety of the analysis would be impossible if Null Hypothesis Statistical Testing were used alone, due to inherent conceptual limitations in NHST. Analysis of 22 radiocarbon dates from five sites at the Columbus Southerly Wastewater Treatment Plant, and comparisons of 40 dates from relevant regional sites, provide for a refined chronology. This chronology better temporally defines previously overlapping Hopewell hamlet occupations, terminal Middle Woodland-early Late Woodland nucleated settlements, and Newtown phase village occupations.

Schwindt, Dylan (Crow Canyon Archaeological Center), Kari Schleher (Crow Canyon Archaeological Center), Michelle Turner (Crow Canyon Archaeological Center), Grant Coffey (Crow Canyon Archaeological Center) and Jerry Joplin (Crow Canyon Archaeological Center)

[147]

Using Computer Vision and Deep Learning Algorithms to Predict Pottery Types: An Example Using Ancestral Pueblo Pottery from the Central Mesa Verde Region

Computer vision, machine learning and artificial intelligence techniques have made much progress in the past several years. Cloud computing has rendered these tools more accessible than ever to researchers in a wide range of fields. Here we explore applications of these models to classify Ancestral Pueblo pottery types in the central Mesa Verde region of southwestern Colorado. We explore a range of models, from deep learning models based solely on image analysis to models that include imagery combined with simple, user provided observations to predict pottery typology. We also compare deep learning models that predict typology directly with more traditional models that use attributes to predict typology to models that combine both approaches. Finally, we discuss the most promising predictive models for public education products about archaeology and ancient Indigenous technologies.

Scott, Ann (Terracon Consultants)

[137]

Chair

Scott, Jorden (New Mexico State University)

[122]

Connections between the Mimbrenos People and Local Avian Species

The purpose of this poster is to examine the cultural group known as the Mimbres in the American Southwest and investigate their relationship with avian species through a multi-vocal interpretation of pottery iconography, present from AD 1000–1150. Many studies have focused on southwestern species of birds, but often with a direct focus on popular birds, including the eagle, turkey, and the macaw for two main reasons: 1) these avian species are associated with ritual use and are further preserved in the archaeological record through burial, and 2) these species imprint as chicks, allowing them to easily be kept as house birds. Each of these themes surrounding the three birds has led to their status in studies; however, two key factors have often been ignored. The first is the lack of Native voice and the second is a lack of focus on birds that are rarely present in the archaeological record and do not showcase the ability to imprint. Mimbres pottery displays the direct interaction held between Mimbrenos and these common species, but these bowls also, depict many other bird species. This research intends to offer a beginning, multi-vocal platform for understanding relationships between Mimbres populations and small wild aves.

Scott, Jorden [136] see Arakawa, Fumi

Scott, Jorden [122] see Cron, Lindsey

Scott, Michael (Trent University) and Paul Szpak (Trent University)

[64]

Chew the Fat: Examining Applications of Lipids in Archaeological Bone

In this study we applied gas chromatography-mass spectrometry to lipids extracted from the bones of modern and archaeological fauna in order to evaluate the potential use of bone lipids for furthering studies of palaeo-ecology. The aims of this study were three-fold: 1) Determine what similarities exist between lipids in bone and soft tissue to better understand how they are routed through diet. 2) To assess their preservation in the bones of archaeological specimens by confirming whether they vary among species according to ecological expectations or are simply the result of degradation/contamination. 3) To measure the effectiveness of various lipid extraction techniques used by archaeologists and ecologists by examining the lipids obtained from bone by each technique. Our analyses have demonstrated that lipid profiles vary depending on when the lipids are extracted (i.e., before or after demineralization of the bone). The total abundance of lipids found in bones is much less than in soft tissues, however, bone lipids most resemble marrow and adipose lipids in terms of types and proportions present. Additionally, lipid profiles vary among species in archaeological bone.

Scott Cummings, Linda (PaleoResearch Institute)

[119]

Introduction of Wheat into North America: The Role of Spanish Missionaries

Colonization of Central and North America involved Spanish mission construction and growing wheat necessary for Eucharist bread. Using evidence of threshing technology, represented by cut phytoliths, as an indicator of trait adoption, we examine missions in California and the Puebloan region. Introduction of a new religion, new icons, new structures, and new food into traditional cultures is examined using quality of threshing evident in these locations. Traditional threshing sledge use in Spain, the Near East, and circum-Mediterranean produces tiny to microscopic cut straw fragments, establishing a standard. This also was observed in California adobe. The New Mexican Pecos Mission adobe samples, however, yielded wheat seeds and large straw fragments with cuts, indicating coarser chopping and suggesting difficulties in adoption of the new system. Challenges of supplanting well-known maize cultivation and processing by wheat in the Puebloan community are compared with success in introducing wheat cultivation and processing to people in California who did not have a grain-based economy. Maintaining standards appears to have been more difficult in New Mexico, suggesting other challenges in a transition not only from maize to wheat, but also in religion and socially, as is evidenced by the Pueblo Revolt of 1680.

Scott Cummings, Linda [180] see Gingerich, Joseph A. M.

Scott Cummings, Linda [66] see Varney, R. A.

Scullin, Dianne**[25]***Moche Sonic Artifacts: Creating a Desired Soundscape*

Music is humanly organized sound, it imposes sound as an order on the world through active and often elaborate cultural choices. Despite only forming a small portion of the overall soundscape within which all human beings reside, the overtly intentional nature of music, and the relative durability of sound-producing artifacts, present relatively accessible entry points for the archaeological analysis of social and cultural soundscapes. The design, manufacture and use of Moche sonic artifacts represent a direct intervention into the environmental soundscape of the North Coast of Peru between AD 100 and AD 900. This intervention moves beyond the sounds that the human body can generate, to a world of entirely new humanly created sound. This paper will present data concerning the types of sounds produced by the wide variety of Moche sonic artifacts in order to uncover both what types of sound the Moche people desired, or perhaps required, and the wider implications of these sonic interventions.

Sealy, Judith (University of Cape Town)**[240]***Territoriality and marriage patterns in coastal hunter-gatherers from $\delta^{15}\text{N}$*

Throughout the world, productive coastlines and riverine environments supported less mobile—even sedentary—hunter-gatherers. Along the southernmost coast of Africa, there is evidence for low mobility in the form of localised clustering of $\delta^{15}\text{N}$ values in skeletal remains. In particular, there is a marked discrepancy between unusually high $\delta^{15}\text{N}$ values in people buried on the Robberg Peninsula and nearby Plettenberg Bay, compared with moderate values at Matjes River Rock Shelter, 14 km to the east. The two groups had different diets (or economies); people buried in the former area specialised in high trophic level marine foods, while those in the latter were generalists. A major estuary probably marked the boundary between two hunter-gatherer territories. New research compares $\delta^{15}\text{N}$ in the dentin of early-forming permanent teeth (incisors and first molars) with bone from the same skeletons, to ascertain whether people from Robberg/Plettenberg Bay married within their own group (both dentin and bone should show high $\delta^{15}\text{N}$), or whether marriage partners came from further afield ($\delta^{15}\text{N}$ in dentin should be lower than bone). Results thus far support within-group marriage. This raises interesting questions about group sizes required to maintain long-term viability, and the nature and extent of regional networks.

Sealy, Judith [240] see Pfeiffer, Susan

Searcy, Michael [147] see Jepsen, Jacob

Searcy, Michael [173] see Snow, Meradeth

Searcy, Michael [169] see Summers-Wilson, Rachel

Seare, Abraham (Oriental Institute of the University of Chicago)**[268]***Digital Methods in Archaeology: The Mortuary Patterns of the Ocoña and Churunga Valleys of Southern Peru and Its Digital Typology*

The Corral Redondo Archaeological Project has conducted excavation, survey, and conservation studies for two field seasons in the Ocoña and Churunga valleys of southern Peru. One of the primary objectives of the project is to understand the cultural occupation sequence of the region through a combination of excavation at the site of Corral Redondo and systematic archaeological survey. By studying mortuary patterns from nine sites, the author explores the utility of a digital typology when used to conduct a comparative analysis of tomb construction and cemetery locations. The mortuary context is primarily examined spatially and architecturally, using digital methods including GIS, photogrammetry, and an online database, OCHRE (the Online Cultural and Historical Research Environment). While exploring the prehispanic mortuary behavior in the Ocoña and Churunga valleys, the author will also showcase the strengths of these digital methods in archaeological studies to document, analyze, and preserve information for the future, with a special focus on database implementation.

Searles, Jessica**[213]***Early Nineteenth-Century Coffin Construction in North America*

This study examines what coffin styles were popular in a specific place or region. Is there a particular reason for the style; religious, economic or otherwise? This study also investigates whether or not the coffins are being built with little attention to detail or if it is a well thought out craft? What types of wood are being used? Is the wood coming from nearby or is it being brought in from a much farther distance? After analyzing the coffin wood and hardware from Fort Brooke in Tampa, a comparison of the data is made with other sites to give a deeper view of the significance of coffin construction during the expansion era of sub-tropical frontier Florida.

Sears, Erin (University of Kentucky/Smithsonian Institution)**[168]***My Q-Mode Brings all the "Boys" to the Yard*

The professional and personal chapters in Ronald L. Bishop's life have always incorporated aspects of archaeology. This paper discusses the historic connections to other disciplines that allowed Bishop to create an interdisciplinary trajectory while as a graduate student and continuing a new career path that incorporated archaeometric approaches within an anthropological context. How Late Classic Maya ceramic figurines became incorporated into the Maya Ceramics Project will also be discussed.

[168]

Chair

Sebastian, Lynne (SRI Foundation)**[58]***Discussant***Sedig, Jakob (Harvard University)****[136]***Mimbres Great Kivas and Communal Structures at the Woodrow Site*

This paper discusses what has been learned about the ceremonial structures at the Woodrow site, a multicomponent Mimbres village on the upper Gila. One of the most notable architectural features at the site is the northern great kiva, which has been surveyed through remote sensing and partially excavated. While generally similar to other Mimbres great kivas, it also had a number of distinguishing features, such as being one of the largest in the Mimbres region. The northern great kiva was also part of the sacred-ceremonial center of the site, located only a few steps from another large great kiva and prominent central room block. Another atypical feature of the northern great kiva is its use history. After the structure's original use ended the roof and center post were removed. An alignment of large stones was then placed in the center of the structure. Such a dramatic remodeling of one of the most prominent ritual structures in the upper Gila would have been conspicuous and deeply symbolic. This, along with its association with other ceremonial structures, suggest differences between the upper Gila and Mimbres river valleys in how ritual space was conceived and used.

Sedig, Jakob (Harvard University)**[173]***Chair*

Sedig, Jakob [173] see Punzo Díaz, José Luis

Sedig, Jakob [173] see Sirak, Kendra

Seersholm, Frederik [19] see Linderholm, Anna

Segsneider, Martin (NIhK), Hauke Jöns (NIhK), Moritz Mennenga (NIhK) and Jonas Enzmann (NIhK)**[238]***SPLASHCOS-Network, SPLASHCOS Viewer, and the Mesolithic Site of Strande*

Since 2009, the European Commission-funded SPLASHCOS-Project has been setting up a Europe-wide network as a framework for scientific exchange about findings, methods and techniques as well as for discussions about strategies concerning the long-term preservation and heritage management of prehistoric landscapes and sites in the marine waters. One major outcome of the collaboration is the information system SPLASHCOS-Viewer, which was set up to provide free public internet access to all information currently available on submerged stone-age find-spots in the European Seas. As an example, a more detailed view is taken on the ongoing research of the well-preserved Mesolithic site Strande in the Baltic Sea near Kiel, Germany.

Seibel, Scott (AECOM) and Matthew Harris (AECOM)**[9]***The Water and the Land: How the Private Sector and Government Work Together to Plan for Climate Change Impacts to Cultural Resources*

Government, inclusive of the local, state, and national levels, is the largest aggregate landholder in the United States and has under its direct jurisdiction the largest array of cultural resources in the country, not to mention the cultural resources under jurisdictional oversight. As such, government is at the spear's point of climate change impacts to cultural resources and thus the need to develop responses to preserve important heritage on behalf of its constituents. That said, the direct ability of government to develop solutions and respond directly is limited by staffing constraints dictated by annual budgets and circumscribed mandates focused on the locations and resources under their direct control and oversight. Conversely, while the private sector typically controls only relatively small and discontinuous landholdings and has no legal mandate, it has a broader, more holistic perspective on potential solutions due to the range of clients it serves, the geographies it covers, and its greater flexibility to engage staff with specialized knowledge and expertise. This poster demonstrates how AECOM as a company works with municipal, state, and federal government agencies to provide strategies and solutions that address climate change impacts to their important cultural resources.

Seibel, Scott [9] see McDaid, Chris

Seidel, Andrew (Arizona State University)**[99]***Persons and Places: Ontology and Landscape Use among Kentucky Adena Groups*

Aside from their role in mortuary programs, the construction of burial mounds by past populations is frequently understood as being involved in the formation and maintenance of territorial systems. The consideration of anthropological interpretations of non-Western ontologies, however, enables the proposition of alternative ways in which past groups may have engaged with such monuments. Using metric and morphological characteristics of the cranium and dentition exhibited by individuals derived from nine Adena burial mounds located in northern Kentucky, this presentation evaluates the degree to which Adena burial mound populations are consistent with the expectations of a territorial model. Results suggest that, although the use of Adena mounds as places of interment was complex and exhibits both geographic and diachronic variation, their characterization as territorial phenomena is problematic. Moreover, this presentation illustrates how consideration of non-Western ontologies enables archaeologists to ask new questions of old data and to produce more nuanced interpretations of past behavior.

Seidemann, Ryan (Louisiana Department of Justice) and Christine Halling (Louisiana Department of Justice)
[248]

Assessing the Taphonomy of 29 Human Anatomical Specimens Confiscated in Louisiana

Anatomical specimens used for teaching frequently become available for sale online. In one Louisiana case, authorities to confiscated 29 human anatomical specimens. These specimens are used to highlight the breadth of information that can be gathered from such specimens. Anatomical specimens are easily identified by the autopsy techniques used to prepare them and the hardware applied to them. Postmortem alterations of these specimens result from frequent handling by students and teachers, increasing the likelihood of damage, loss of teeth, pen or pencil marks, or even the buildup of a patina on the surface. The specimens discussed here are all skulls, displaying subtle variations of preparation that seem to be indicative of different anatomical supply companies' preparation techniques. These specimens represent individuals of all ages and ancestry, with some unique pathological conditions including labret wear, generalized porosity, and evidence of infectious disease processes. Anatomical specimens pose unique challenges with regard to postmortem damage that can make analysis more challenging, but overall contain verifiable information and confidence that the anatomical specimen was likely prepared by a company rather than a victim of looting.

Seidemann, Ryan [80] see Halling, Christine

Seikel, Katherine (AmaTerra Environmental; Australian National University), Mindy Bonine (AmaTerra Environmental) and Timothy Griffith (AmaTerra Environmental)
[176]

The Headwaters Site: Preliminary Site Analysis and Featured Finds

Site 41CM204, the Headwaters Site, is a serially occupied archaeological site in New Braunfels, Texas. The site is located at the headwaters of the Comal River and was occupied seasonally for approximately 8,000 years, up to and including the historic period. However, the Archaic Period deposits are the most notable, with excavations revealing over 30 identified features, particularly burned rock middens and earth ovens from hot-rock cooking activities. Excavations conducted by AmaTerra Environmental, Inc. at the Headwaters site in 2018–2019 recovered over 100,000 artifacts and samples. This poster presents the results of the 2018–2019 excavations focusing on feature types, artifacts, and preliminary analysis of site components.

Seikel, Katherine [194] see Bonine, Mindy

Seikel, Katherine [100] see Levin, Maureece

Seitsonen, Oula [62] see Égüez, Natalia

Selden, Robert, Jr., Michael Shott (University of Akron) and Morgane Dubied (Université de Bourgogn)
[17]

Processing Matters: 3D Mesh Morphology

Substantive advancements have been made toward automating the application of landmarks and semilandmarks. These approaches can aid in expediting the landmarking process, while simultaneously reducing landmarking errors and investigator bias. This study enlists a template-based approach to quantify deviations in mesh processing outputs using a Pontchartrain dart point from the collections of the National Forests and Grasslands in Texas, which was scanned and processed at multiple resolutions using microCT and laser scanners. Following data collection and output, meshes were processed using an automated and replicable workflow. A batch processing protocol was developed in Geomagic Design X and Control X to facilitate exploratory comparisons of the processed meshes, which indicated that the greatest changes to the meshes occurred along the lateral margins of the dart point. Results of the geometric morphometric study evince implications for processed meshes curated in digital repositories, making it clear that should investigators endeavor to incorporate curated meshes that they should begin with the unprocessed data, enlist uniform processing protocols across the sample, and comprehend the many vagaries of 3D data collection and processing across different modalities.

Selden, Robert, Jr.
[95]

Discussant

Selden, Robert, Jr. [17] see Covey, R. Alan

Selden, Robert, Jr. [17] see Etter, Bonnie

Self, Caleb [252] see O'Mansky, Matt

Seligson, Ken (California State University, Dominguez Hills)
[20]

A Whole Lot of Holes: An Abundance of Quarries at Muluchtzekel as a Marker of Geological and Material Wealth

Aided by lidar-derived digital elevation models, the systematic survey of the eastern Puuc site of Muluchtzekel in the Northern Maya lowlands has led to the identification and ground-truthing of dozens of limestone quarries. The quarries range in size from a few meters in diameter for the smallest pit quarries to over 50 m in the length for the longest ledge quarries. Their prevalence, along with the high frequency of masonry and vaulted structures in the region, suggest that stone extraction and processing were significant socio-economic industries in the Puuc. This paper presents excavation data from a large ledge quarry, multi-elemental analyses of stone samples, and spatial and contextual evaluations of quarry shapes, sizes, and locations across the site. Findings suggest that

the higher status inhabitants of Muluchtzekel could count on having access to high quality architectural stone regardless of where they chose to build their residences. Preliminary analyses suggest that certain grades of fine-grained local limestone could have been used as extraction tools for quarrying softer grades of limestone, thus avoiding a complete reliance on the importation of non-local chert.

Seligson, Ken [230] see Ringle, William

Sellet, Frederic [244] see Potter, Bethany

Seltzer, Heather (Aspen CRM Solutions)

[214]

Life on the Northern New Mexican Frontier: Historic Homesteading in the Rio Grande del Norte National Monument

The area of the Rio Grande del Norte National Monument, near Taos, New Mexico was extensively used during both prehistoric and historic times. The historic period has typically been the lesser emphasis for cultural resource investigations in the area. The area around the Monument, saw growth in 1880 when a branch of the Denver & Rio Grande Railroad, called the Chili Line was established. The construction of the Chili Line encouraged the growth of pastoralism and logging and with that, more Anglo and Hispanic settlers came to the area. In addition, the Homestead Act of 1862 provided land grants to individuals in the Taos area. This poster reports the results of a recent survey within the Monument, in which many different historic land use practices were documented, including early turn of the twentieth-century homestead sites, sheep herding camps, features documenting early vehicle exploration, perlite mining, and woodcutting. In particular, the Gibsons' 1920s Homesteads and possible Athabaskan artifacts and features that predate this homestead but were found within the same site are the primary focus for this poster. Results are contextualized with data from the greater Taos area to investigate daily life and trade relations on the frontier.

Semanko, Amanda (New Mexico State University)

[270]

Prehistoric Dogs of the Southwest

For more than 15,000 years, dogs have held a position that transcends the dichotomy of human society versus animal world. In view of this, the Canine Surrogacy Approach derives from the observation that prehistoric dogs had special social roles which allowed them to consume the same foods as people and accompany humans during migration. Often, dogs were employed as guardians of homes and crops, and even granted burials similar to humans. I explore this proxy approach through the case study of a Georgetown-phase (AD 550–650) dog burial from Kipp Ruin, a Mimbres site in southern New Mexico. Analyses of stable isotopes can shed light on the diets of both dogs and humans, and I will demonstrate their potential to identify migration patterns as well. To further contextualize the life histories of domestic dogs, I compare the frequency and circumstances of other dog burials in the Southwest with ethnohistoric and ethnographic data from indigenous southwestern cultures.

Semon, Anna (University of North Carolina)

[185]

Surveying New York City Collections at the American Museum of Natural History

The North American Archaeology Collection at the American Museum of Natural History contains more than 4,000 cataloged objects from New York City. These accessions were acquired or donated to the museum between 1869 and 2017. In this poster, I examine these legacy collections by exploring the materials and artifact types collected from the area. In addition, I present spatial data associated with these accessions and focus on reconstructing several site locations within the boroughs, including City Island, Pelham Bay Park, and Van Cortlandt Park in the Bronx; Inwood and Washington Heights in Manhattan; and Mariner's Harbor, Old Place, Tottenville, and Watchogue in Staten Island. This research helps to explore city development through time and improves our understanding of past landscapes in New York City.

Semon, Anna [119] see Musch, Abigail

Seowtewa, Octavius [156] see Baxter, Erin

Seowtewa, Octavius [127] see Dongoske, Kurt

Sepulveda, Marcela [74] see Gayo, Eugenia

Serafin, Stanley [237] see George, Richard

Sesler, Leslie (La Plata Archaeological Consultants)

[165]

The Famous, the Infamous, and the Unknown: A Just-so Story at the Intersection of Archaeology and History in Canyon of the Ancients National Monument, Southwest Colorado.

Archaeologist sometimes make up "just-so" stories to help explain to themselves what the archaeology is telling them. Sometimes these stories are whispered to trusted colleagues when no one important is listening. Sometimes these stories are made more public, and occasionally, if a person has sufficient academic capital, they even get published. This is a "just-so" story of sorts, but

with the backing of history. The story concerns the archaeological survey of a 160-acre parcel of acquired land in Yellow Jacket Canyon, within Canyon of the Ancients National Monument in southwestern Colorado. Only one site had been previously recorded within the parcel, a small Pueblo III village with an estimated 25 to 40 rooms and at least 10 kivas. This site and several others found during the survey are intricately interwoven with a set of historic events and intriguing historical figures, all important in their own time. Viewed through the lens of history, some were honorable, some unscrupulous, and some deplorable.

Settle, Kathleen

[167]

Bethel Cemetery Relocation Project: An Introduction and Overview

The Bethel Cemetery was relocated to allow for the expansion of industrial facilities surrounding the Indianapolis International Airport, located on the southwest side of Indianapolis, Indiana. The project involved initial mapping and documentation of all marked burials in the cemetery, background and genealogical research on all identifiable interments, geophysical investigation to identify unmarked grave shafts, professional removal of headstones, systematic excavation of all interments, analysis of all skeletal material and grave goods, headstone restoration, and finally, reburial of all recovered materials. Local and state agencies, members of the community, descendants, and military groups were involved in all stages of the project. The project also paired with local universities and facilitated multiple master's theses, allowing researchers to conduct a thorough analysis of grave goods and burial patterns used by the community at the time the cemetery was active. The new cemetery layout reflects original grave locations and kept family groups together as much as possible, which will continue to allow descendants to pay their respects to their ancestors.

Seyler, Samantha (University of Pennsylvania)

[105]

Terraces All the Way Down: A Comparative Analysis of Agricultural Landscapes within the Mantaro Valley and the Ceja de Montaña to the East

The contemporary world is characterized by a completely modified landscape, a product of long histories of human-environment interactions. In the Andes, this long history of human modifications of the environment is most apparent in the agricultural terrace systems that dominate the visual landscapes of the steep Andean Mountains. While these features and associated agricultural infrastructure have been ignored in traditional settlement surveys and site excavations, landscape archaeologists recognize terraces as significant features of the built environment. Scholars recognize that human-manipulation of land for agriculture through the construction of field boundaries, terraces, canals, roads, and other infrastructure, reflect not only economic and political organization in the past, but also ideas about aesthetics, ideology, cosmology, and proper forms of land management grounded in community identity and landscape history. In this paper, I use satellite imagery to document patterns of land use between two ecologically distinct but historically connected regions of the central Peruvian Andes. Through the comparison of land use patterns between the Mantaro Valley and the ceja de montaña to the east, I provide a general assessment of agricultural landscapes of this region, as well as a tentative discussion of the relationships between agricultural communities of these two distinct zones.

Shackley, Steven [5] see Lazik, Lauren

Shackley, Steven [203] see Moss, Jeremy

Shafer, Harry (Texas A&M University, Professor Emeritus)

[136]

New Perspectives on the Ritual and Communal Space Use at the NAN Ranch Ruin, Grant County, New Mexico

Recent syntheses in Hohokam archaeology and new data from excavated Classic Mimbres sites such as Swarts, Mattocks and Old Town has called for a new look at ritual and communal space use at the NAN Ranch Ruin, a Classic Mimbres pueblo in the Mimbres Valley. The NAN Ranch Ruin is one of the longest occupied Classic Mimbres sites and stands out as one of the more complex Mimbres site yet investigated with regards to architectural and extramural features. The chronology extends through the Pithouse and Classic Mimbres periods. An evolution of ritual and communal space use is apparent in the changes from the pithouse to pueblo periods. This paper will focus specifically on ritual and communal space during the Classic Mimbres period together with review of Late Pithouse Period ritual space.

Shakour, Katherine (University of South Florida)

[134]

Making Impossible Decisions: Examining Disaster Responses in Nineteenth-Century Ireland

Scholars have studied how disasters impact contemporary communities and have explored the strategies and institutions that may contribute to regrouping of individuals, households and societies. In disaster research, island communities are said to be particularly vulnerable to the catastrophic events and the long-lasting impact. Specific to Ireland, some scholars have explored the nineteenth century famine, but they have largely been historians and economists. While famines can be difficult to identify in the archaeological record, this project utilizes consumption of ceramics to understand the coping mechanisms and survival techniques of communities during the nineteenth-century famine. In this paper, the author examines how communities on Inishbofin and Inishark, islands about five miles off the coast of County Galway, Ireland, responded to the nineteenth century disaster through permanent and seasonal migration and short- and long-distance migrations. This research uses ceramic assemblages from the two islands and comparative collections from County Mayo, County Donegal, and County Roscommon. The comparison allows for a discussion on how island communities accessed different resources following the trauma of the famine. As a result, scholars need to reconsider the circumstances in which communities are classified as more or less vulnerable during trauma and disaster.

[134]

Chair

Shannon, Robert [203] see Kelly, Nigel

Shao, Huiqiu [212] see Wang, Chunxue

Shapiro, Craig (The Ohio State University)

[77]

Geospatial Analysis of Prehistoric Agricultural Systems in Samoa

This project utilizes geospatial technologies to identify the archaeological features of Samusu Village, located in the Sāmoan island of Upolu's easternmost district of Aleipata. Outlined in this inland area are the remains of a network of prehistoric agricultural ditches that still channel rainwater—alleviating the effects of flooding and erosion at lower elevations. Using the lidar dataset for Sāmoa and ArcGIS, this project analyzes the frequency and configuration of ditch and terrace systems to study their effectiveness as flood management systems in Sāmoa. Flood capacity of the agricultural ditching system is determined via GIS-based hydrological analysis; the flow structure of the ditches' sections and nodes are similarly outlined via geospatial network analysis. Testing the Aleipata complex focuses on determining maximum water flow capacity, identifying areas at high risk for inundation, and serving as a replicable model for predicting the resilience of human-modified environments. Such modeling determines the change in efficacy of any flood management system within a flood-prone landscape. Sāmoa, therefore, is a seminal case study for agricultural systems as a risk management system for extreme climatic events and for expanding the use of lidar as a tool for promoting climate resiliency.

Sharkey, Elizabeth

[186]

Walking the Arbitrary Line: Improving our Federal Archaeology Permitting Process

The practice of federal archaeological permitting by state and county lines is an archaic process. Permits should be issued based on an applicant's experience within cultural, or even geographical, rather than political boundaries. Our discipline should seek to abolish the Eurocentric compartmentalization of cultural resources based on irrelevant modern boundaries which ignore the permeable nature of cultural boundaries. This study seeks to illuminate the irrelevant nature of the permitting process that excludes qualified archaeologists from conducting work in culture regions with which they are clearly familiar.

Sharon, Gonen [60] see Berger, Uri

Sharp, Kayeleigh (Southern Illinois University Carbondale)

[182]

Monuments, Canals, and Ancient Emojis: The Northern Gallinazo Polity in Perspective

Gallinazo sociopolitical organization is rarely considered outside the Virú Valley heartland. My recent work in the Lambayeque region of northern coastal Peru, however, brings to light several key features that are transforming long-standing perceptions. In particular, the notable pattern of large-scale monument building near dramatic natural landforms juxtaposed by stone-masonry residential complexes that are often found in association with canal systems and mineral resources. This presents a picture of a thriving, self-sufficient, self-governing regional workforce. Most intriguing are the strong associations between these likely mono- and multi-ethnic first-millennium sites and the major presence of pottery decorated with emoji-like expressions in the Castillo-style (a.k.a. Gallinazo). As I discuss in this paper, the northern Gallinazo is far from being a utilitarian substratum of other cultural traditions. The two prominently Gallinazo sites of Songoy-Cojal situated in the mid-Zaña Valley and Huaca Letrada in the La Leche Valley provide strong evidence to support this claim. Might the Lambayeque region hold answers to questions of independent Gallinazo developments and social identity? In this paper I present new lines of evidence that help to place the northern Gallinazo polity in perspective.

Sharp, Kayeleigh [254] see Bradley, Benjamin

Sharpe, Ashley (Smithsonian Tropical Research Institute)

[27]

The Learning Curve: Toward a Better Understanding of Zooarchaeology in the Tropics

As a science, zooarchaeological analysis in the tropics is now several decades old, yet it is facing new challenges daily. The main source of the dilemma, which conversely makes the tropics so interesting, is that there are more animal taxa in these regions than anywhere else in the world. Biologists continue to make new identifications every day of extant fauna, both by identifying previously unknown animals in the field but also through the use of new genetic techniques on old collections, even archaeological collections. As well, all animals have their own unique environmental niches and behaviors, which influenced how past peoples have hunted, reared, or viewed specific species. Here I present a few case examples of dilemmas I and others have encountered in both the field and lab while examining zooarchaeological remains. Currently the study of tropical fauna from archaeological sites necessitates a steep learning curve, and there are many potential pitfalls regarding misidentifications, misunderstanding animal behavior, misinterpreting human behavior, and errors in data collection. Nonetheless, there have been several recent advances in archaeology and biology that may allow us to overcome some of these problems in the near future, which should encourage future investigators in the field.

Sharratt, Nicola (Georgia State University) and Ryan Williams**[127]***Extractive Activities and Animate Landscapes: Apu and Resource Acquisition in the Andes*

Archaeological, ethnohistoric, and ethnographic records all indicate the enduring and far-reaching importance of animate landscapes in Andean South America. In particular, apu—powerful mountains worshipped as spirits that could both protect and also wreak catastrophe—figure significantly in reconstructions of politics, identity, and religion in diverse times and places in the Andes. However, relationships with the landscape are comparatively less integrated into the increasingly robust and scientifically sophisticated scholarship on the acquisition of natural resources for craft production in the prehispanic Andes. Instead, while the application of techniques derived from analytical chemistry has generated a wealth of geochemical data on raw materials and artifacts, interpretations of those data are strongly influenced by theories of political economy. In this paper, we reevaluate geochemical data on clays and archaeological ceramics from three distinct Andean regions: Cuzco; the Moquegua Valley in southern Peru; the Azapa and Lluta valleys of northern Chile. Complementing the compositional data derived from Laser Ablation Inductively Coupled Plasma Mass Spectrometry with ethnohistoric and ethnographic perspectives on local landscapes, we explore how choices about clay procurement—an intrusive and extractive intervention into the landscape—in these three regions were shaped by relationships with sacred places.

Sharratt, Nicola [260] see Muñoz, Lizette

Shaw, Justine (College of the Redwoods) and Thania Ibarra (Escuela Nacional de Conservacion, Restauracion, y) and Justine Shaw**[130]***Everyday Life during the Late Terminal Classic in the Coahuah Region*

Following a peak in construction activity during the Terminal Classic, most of the 105 sites documented in the Coahuah Region in the central Yucatán Peninsula were abandoned with only a fraction boasting minor Postclassic activity in the form of small shrines and temples. However, at a number of settlements, a much-reduced population continued during a newly defined phase termed the Late Terminal Classic. During this time, in addition to open-fronted (C-shaped) structures, residents built small, round foundation braces and scavenged tools and ceramic vessels from earlier structures. Excavations of the round constructions have revealed a mix of cultural continuities and innovations as inhabitants struggled to continue in what would have been an extremely challenging and turbulent time period. The excavations are able to provide details about what everyday life was like through the patterning of soil chemistry, ancient starches, and artifact distributions in and around four of the round structures. This patterning is considered in comparison to a variety of archaeological and ethnographic examples.

Shaw, Justine [130] see Shaw, Justine

Shaw, Ryan [24] see Rabinowitz, Adam

Sheets, Kimberly (Washington State University)**[270]***Using Strontium Isotope Analysis to Connect Ancestral Hopi to the Landscape, Homol'ovi Settlement Cluster, Northeast Arizona*

Faunal assemblages from the Homol'ovi Settlement Cluster (HSC) are characterized by an abundance of bighorn sheep (*Ovis canadensis*). This is unusual because these animals are nonlocal to the immediate area surrounding HSC sites. This paper presents the results of strontium isotope analysis conducted on specimens from two HSC sites, Homol'ovi I and Chevelon Pueblo. Four potential source locations were considered (Grand Canyon, Black Mesa, San Francisco Peaks, and White Mountains). When the isotopic data is contextualized with existing cultural data, I argue that the most likely location of procurement is Black Mesa, the historic homeland of HSC occupants. Furthermore, I argue that long-distance procurement from the wider Black Mesa region represented a desire to maintain social connections with the Hopi Mesas. This study emphasizes the role of human-animal interactions in structuring social identity.

Sheets, Payson (University of Colorado)**[46]***Come On, Mayanists, Let's Go for the 99%*

Throughout my professional career, Maya archaeologists have tended to search for and excavate the tallest pyramids, the largest palaces, and the most richly stocked tombs. Many have tried to find the finest sculptures, most colorful ceramics, and most intricate lithic eccentrics. However, these archaeologists focus only on the “one percent” of ancient Maya society. What about the other 99%? What might we learn if Maya archaeologists studied the rest of society, thus understanding why ethnographers avoid studying miniscule fractions of societies? My own advocacy for the “common” people largely derived from my good luck in encountering them at the Ceren site in El Salvador, covered by and preserved under volcanic ash. The richness of life at the young village of Ceren has been astounding, and virtually all of it well beyond any control by external authority. That site certainly has been a “Cerendipitous” discovery, to teach us much about commoner sophistication. My respect for commoner achievement has been furthered by my discoveries among egalitarian villages in ancient Costa Rica.

Sheets, Payson (University of Colorado)**[90]***Moderator*

Sheets, Payson (University of Colorado)**[157]***Discussant***Shelach-Lavi, Gideon (The Hebrew University)****[62]***Why Build a Wall? Research on a Medieval Wall-System in Northeast Mongolia*

This paper reports on two seasons (2018 and 2019) of archaeological research in Dornod Province, Northeastern Mongolia. Our research focuses on a section of the so-called "Chinggis Khan's Wall": a monumental long-wall system that stretches some 737 km from Northeastern Mongolia, through Russia, and into Chinese territory. It is associated with 42 clusters of large camps and other structures. In spite of its huge size, little is known about this long-wall system—it is not clear when exactly it was built, who built it, or for what purpose. Our project is the first comprehensive attempt to trace the entire length of the wall, and to systematically survey and test-excavate parts of it, as well as a sample of its related structures. The results of our excavations allow us to reconstruct the structure of the wall and associated features. This information, as well as a GIS analysis of the location of the wall and the accompanied structures, is used to address the function of the wall-system and to generate hypotheses about the motivations for its construction.

[62]*Chair***Shelley, Nathan (Texas A&M) and Kelly Graf (Texas A&M)****[81]***A Preliminary Spatial Analysis of the Late Pleistocene Components at the McDonald Creek Site, Interior Alaska*

The McDonald Creek site (FAI-2043) is located about 30 miles south of Fairbanks, Alaska, in the Tanana Flats. Results of archaeological testing and excavations between 2013 and 2019 identified three distinct archaeological components, Components 1, 2, and 3 dating to about 13.8 ka, 12.7 ka, and 5 ka, respectively. Approximately 40,000 pieces of archaeological materials have been found in situ with three-point provenience, and most of these come from the earliest component. The high density of artifacts and features in the early components at McDonald Creek provide a rare opportunity to gain insight into site use, adaptive strategies, and settlement organization of these early inhabitants of Beringia. For this poster, we will model the artifacts from Components 1 and 2 using ArcGIS and ArcScene to display both 2D and 3D maps of each component separately and in relation to each other. Then we will use these models to document horizontal artifact clustering in relation to field-identified features to document activity areas and test the degree of vertical separation between components.

Shelley, Nathan [81] see Graf, Kelly

Shen, Chen [94] see Cheng, Wen Yin

Sheng, Lishuang [162] see Wang, Jiaqi

Shephard, Christopher (Virginia Dept. of Transportation)**[251]***Material Bodies, Living Objects: Bodily Adornment and Death in the Algonquian Chesapeake*

This paper explores the relationship between the human body and the objects that adorned them within the Late Woodland through early Colonial (AD 900–1680) Algonquian Chesapeake. Drawing on the notion that the human body represents the battle ground upon which political authority is established, I am interested in articulating the many ways that adornment objects (extensions of the body) were deployed to expand, counteract, or contradict human agency. Historic Algonquian interactions with shell and copper, tangible metaphors for birth and social action, demonstrate that these materials exhibited human-like qualities and, at times, animated relations with the insentient (the skeletal remains of dead relatives, for instance). At the same time, these shifting animacies were bound up in the transformation of people and their bodies into something more akin to objects, as slaves, body parts taken as war trophies, and skeletal remains that were commingled, burned, or buried. Having observed burial ceremonies, the chiefly (re)distribution of shell and copper ornamentation, and rituals aimed at suppressing dangerous non-human actors, seventeenth century English colonials knew the significance of beads and beadwork in the Powhatan political sphere. Efforts then were aimed at controlling these objects and by proxy, the Algonquian bodies that they adorned.

Sherfield, Anne (Arizona State University)**[7]***Differential Access and Socioeconomic Inequality at Teotihuacan*

I investigate patterns of social and spatial inequality at Teotihuacan, Mexico. Differential access to civic resources is a well-documented mechanism of socio-economic differentiation in historic cities and can be measured by analyzing movement within the built environment. I measure differential access at Teotihuacan by simulating movement pathways from residential structures to the great compound and the plazas of the sun, moon, and feathered serpent pyramids. The locational data for this study was gathered from publications of excavated structures and the Teotihuacan Mapping Project's architectural survey. A baseline of best possible accessibility was created using the minimum distance model which assumes that the only variable affecting access is distance. Then, pedestrian movement from the doorways of residential structures to the great compound and pyramid plazas was simulated using a GIS-based spatial network analysis. This model shows the constraints that the urban environment had on the movements of

individuals. This analysis evaluates the extent to which a structure's access to Teotihuacan's public spaces is a function of its distance, or whether differential access to ceremonial spaces contributed to creating and maintaining social inequality at Teotihuacan.

Sheridan, Susan [35] see Berumen, Sara

Sherman, Diana [172] see McBrinn, Maxine

Sherman, Jason (University of Wisconsin, Milwaukee), Samantha Bomkamp (University of Wisconsin, Milwaukee) and Hannah Blija (University of Wisconsin, Milwaukee)
[229]

Preliminary Results of the Sierra Blanca Archaeological Survey, New Mexico

The Sierra Blanca Archaeological Survey is documenting evidence of the long history of human activity in the Fort Stanton-Snowy River Cave National Conservation Area, located in the Sierra Blanca highlands of south-central New Mexico. This region was an important transitional zone between societies of the American Southwest and the southern Plains during pre-contact times. This paper outlines the goals of the survey project and summarizes the results of the first field season. Sites recorded thus far span from the Formative period (AD 500–1450)—when a complex web of social, cultural, and economic interactions linked the region's inhabitants to neighboring groups—to much more recent times. The latter include historic sites associated with Fort Stanton, a nineteenth-century U.S. military fort.

Sherman, Simon (University of Memphis) and Ryan Parish (University of Memphis)
[194]

Lithic Sourcing at Poverty Point (16WC5) Using VNIR and FTIR Spectroscopy

Poverty Point is a monumental earthwork center dating to the Late Archaic Period (ca. 3700–3100 Cal BP). The site is well known for its diverse collection of foreign lithic materials indicative of a wide-ranging acquisition network. Among the extra-local items recovered from the site are lithic raw materials that were used for bifaces in the form of projectile points and/or knives (PP/Ks). Here, I determined the atomic and molecular composition of 847 bifaces from the Alexander Collection using Visible/Near-Infrared Reflectance (VNIR) and Fourier-Transform Infrared Reflectance (FTIR) spectroscopy. The combined wavelength spectra datasets were compared to a raw material database to determine the location of the parent formations from which the raw materials were obtained. The PP/K raw materials analyzed were sourced to outcrops stretching across the Southeast, Mid-South and Mid-West.

Sherman, Simon [237] see Peacock, Evan

Sheumaker, Christian (University of Texas, San Antonio) and Laura Levi (University of Texas, San Antonio)
[230]

Scouting the Neighborhood: Identifying Architectural Variation through Lidar at Wari Camp, Belize

Archaeological studies of supra-household affiliations have become more prevalent over the past decade in an attempt to understand how people organized themselves across space at different scales. Contributing to this trend, the current paper will focus on neighborhoods as a significant source of socio-spatial variation within ancient Maya communities. At Wari Camp, located in northwestern Belize, detection of neighborhoods proceeded from pedestrian surveys charged with mapping subtle variations in residential architecture. Recent acquisition of lidar imagery has made it possible to see architecture and terrain modifications in several areas of the site that project personnel were unable to access on foot. Unfortunately, it has been difficult to identify Wari Camp's neighborhoods remotely, and their detection will require an expanded lidar tool kit. To this end, and for the purposes of this paper, we will blend Sky View Factor, Slope Severity, and Hillshading visualization techniques. The enhanced visibility afforded by these techniques should allow us to more effectively identify the differences in residential architecture—known as “integrating mechanisms”—that signaled distinct neighborhood affiliations. In so doing we hope to reveal how Wari Camp's neighborhoods systematically structured residents' daily practices and created the shared experiences of everyday life.

Shev, Gene (Leiden University) and Corinne Hofman (Leiden University)
[271]

Localized Fishing Traditions at Late Precolonial Sites in Hispaniola and Jamaica

The faunal record of late precolonial archaeological sites in the Greater Antilles suggest that indigenous peoples in the region relied significantly on marine fish as a food source. Although many contemporaneously occupied sites demonstrate affinities in the forms of ceramic traditions, settlement patterns and terrestrial foodways, there are distinct differences both in the quantity and types of marine resources exhibited at these sites. Fish assemblages of four late precolonial sites in the Greater Antilles, El Cabo in the eastern, and El Flaco and El Carril in the northwestern Dominican Republic, as well as White Marl in Jamaica were analyzed as part of this research. These sites demonstrated key differences, with a notable diminishment in the quantities of marine resources relating to distance from the coastline. Although much of the marine fish species present at these sites region share wide distributions throughout the Caribbean region, there are definitive differences in the presence and absence of certain taxa between these sites. These differences suggest that alimentation choices were largely dictated by the relative proximity of certain coastal environments, such as reefs, estuaries and mangroves, in turn fostering localized fishing practices specific to each site.

Shikrallah, Elizabeth (University of Nevada, Las Vegas) and Danielle Romero (University of Nevada, Las Vegas)
[122]

Costume or Chimera: Hybrid Human/Animal Imagery on Mimbres Ceramics

The imagery of people and animals on Mimbres ceramics has long fascinated both researchers and the general public. Efforts to understand the meaning behind these images are countless with varying results of success. This poster focuses on images that appear to combine elements of animal and human figures in order to investigate design trends and their place in the Mimbres iconographic world. The dataset for this work includes whole vessels from published reports and ceramic databases that provided a known site context in order to grasp a full picture of the imagery and lower the chances of including fake or modified images. This research discusses the ease of deciphering between costumes, transformations, and general diversity (to factor for potter error and frame of reference bias) in representation. Analyzing the context of these vessels also allows for some discussion on the purpose of these designs.

Shikrallah, Elizabeth [150] see Badillo, Melissa

Shikrallah, Elizabeth [148] see Willis, William

Shimada, Izumi (Southern Illinois University), Haagen Klaus (George Mason University), Brandi MacDonald (MURR, University of Missouri), Ken-ichi Shinoda (National Museum of Nature and Science, Japan) and Amy Szumilewicz (Southern Illinois University)
[105]

Cross-Disciplinary Testing of the Multi-lineage Governance Model: Middle Sicán Case

Monumental mounds called huacas are among the most notable prehispanic features of coastal Peru. What do the multiplicity and coexistence of such monuments at a single site represent about group(s) that built them? This is the basic question guiding our ongoing research at the Middle Sicán capital of Sicán on the north coast of Peru. In essence, we aim to clarify the organization of the Middle Sicán leadership. Six monumental huacas at the site were all built close in time (ca. 1000CE) using the same construction method and materials, but have different configurations. They all have an elite cemetery close by and share the seemingly basic religious art. In this paper we discuss emerging results of the systematic comparison of samples from two best-preserved huacas in regard to the technology and chemical composition (INAA) of fine ceramics, funerary customs, and bioarchaeological features including aDNA identity and grouping. The first two analyses have already revealed some important differences. Other analyses are ongoing. Their implications for the multi-lineage governance model are presented.

Shimada, Izumi [5] see MacDonald, Brandi

Shin, Dong Hoon (Seoul National University), Jong Ha Hong (Institute of Korean Archaeology and Ancient History), Jieun Kim (Lab of Bioanthropology Paleopathology and History) and Sun Kim (Research Institute of Buddhist Cultural Heritage)
[244]

Genetic Analysis of the Fifteenth-Century Horse Remains from the Archaeological Site of Korea

Ancient DNA (aDNA) analysis is now a well established technique in archaeological science, especially for obtaining genetic information from ancient animal bones discovered at excavation sites. Despite the academic significance of domesticated animals in understanding human culture and society, their detailed genetic history has not been inferred from aDNA analysis to date. For this study, we analyzed aDNA recovered from horse bones excavated in the fifteenth- to sixteenth-century archaeological site of South Korea. We confirmed that the aDNA sequence is identical to those of domesticated *Equus caballus* DNA reported in NCBI/GenBank. Phylogenetic analysis was also done for the *E. caballus* aDNA and other related taxa sequences, to reveal genetic traits of the domesticated horse that existed several hundred years ago in East Asia, thus providing fundamental information of *E. caballus* across time and space. This research was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2017R1D1A1B03030127).

Shin, Dong Hoon [247] see Reinhard, Karl

Shinoda, Ken-ichi [105] see Shimada, Izumi

Shirar, Scott [82] see Doering, Briana

Shiratori, Yuko (Kyoto University of Foreign Studies) and Ángel González López (North Carolina Museum of Art)
[227]

The Female Terracotta Sculpture at the North Carolina Museum of Art: Pastiche or Fake?

Large-scale female terracotta sculptures were extensively produced in the Mixtequilla region of Veracruz during the Late Classic period. It is likely that numbers of these sculptures were looted and smuggled into the United States prior to the 1970 UNESCO Convention on Cultural Property. This paper focuses the female terracotta sculpture at the North Carolina Museum of Art (NCMA), which shows the characteristics of large-scale female terracotta sculptures from the Mixtequilla region. The authors examined the sculpture under natural and ultraviolet light, considering its aesthetics, visible restorations, and fragments, and conducted provenance research. The investigation also included an interview with Brígido Lara, the restorer at the Museo de Antropología de Xalapa, because the possibility of the NCMA sculpture being one of his creations had arisen. This presentation revisits and recalls Lara's forgeries of sculptures from Veracruz.

Sholts, Sabrina [242] see Pott, Laura

Shott, Michael (University of Akron)

[253]

Point Types as Subjects Using Big Datasets from Southern Ohio

Which point types are more or less abundant per unit time? Do types replace one another or morph from one to another? Do they vary in degree of standardization or in degree of curation by reduction? North American archaeologists rarely pose such questions despite the staggering abundance of points here. Big datasets might help answer these unusual questions, but nonprofessionals possess the largest samples. Our collaborative project with nonprofessionals in southern Ohio documented >5,000 points. We collected two-dimensional landmark data on about 3,000, 3D data on about 250 points. In its own small way, geometric morphometric analysis of this big dataset begins to answer funny questions like these.

Shott, Michael [17] see Selden Jr., Robert

Shrestha, Ramesh [206] see Fernandez Diaz, Juan Carlos

Sides, Lauren

[51]

Visibility and Collective Memory on the San Giuliano Landscape

At the height of its occupation during the Etruscan period (700–330 BCE), inhabitants at the San Giuliano plateau in northern Lazio, Italy constructed hundreds of rock-cut tombs in the surrounding escarpment, effectively creating a “city of the dead” adjacent to their city of the living. Intervisibility between the necropolis and plateau would place inhabitants of San Giuliano in constant visual contact with the deceased, functioning to incorporate shared understandings of cosmogony, the afterlife, and the mythic identities of the dead via memory into their daily lives. This paper examines conceptions of memory and social organization at San Giuliano through viewshed analysis between the necropolis and habitation area. Substantial changes to the vegetation and geology of the San Giuliano landscape since the Etruscan period have made modern assessments of intervisibility unfeasible. However, viewshed analysis in ArcGIS makes reconstructing intervisibility possible. Total and cumulative viewshed models revealed statistically significant visibility between the necropolis and eastern edge of the plateau. Furthermore, multiple viewshed analysis from clusters of tombs separated by location, style, and chronology reveals significant changes in intervisibility after the fifth century, evidencing ripples in San Giuliano social organization that correlate with regional shifts in Southern Etrurian economics and trade networks.

Sieg, Lauren (National Museum of the American Indian)

[96]

Moderator

Siegel, Peter, Emlen Myers (Environmental Resources Management) and John Jones (Archaeological Consulting Services)

[221]

Pipeline to the Past: Documenting Heritage and Prehistoric Cultural Dynamics for the San Miguel-Cuiabá Natural Gas Project in Southeastern Bolivia

Southeastern Bolivia is one of the least-understood regions in South American archaeology. However, this region is of pivotal significance in regard to precolumbian cultural history and the dynamics of cultural interactions, especially given its location at the interface between the Andes and Amazonia. Ethnohistorically and ethnographically a large number of tribal groups have been documented for southeastern Bolivia, including Chiquitoans and affiliated tribes, Chiriguano, Chanés, Yamparas, Sirionos, Bororos, Ayoreos, among others. Archaeological surveys and excavations were conducted within the Bolivian portion of the San Miguel-Cuiabá Natural Gas Pipeline right-of-way (360 km in Bolivia, 266 km in Brazil). The pipeline corridor traverses undeveloped portions of the country, which are among the most understudied in South American archaeology. In total, 58 archaeological sites were identified and tested resulting in over 100,000 artifacts. Excavation results, radiocarbon dates, ceramic analysis, and paleoenvironmental reconstruction fill a gap in our knowledge base for this region of South America. Project findings relate directly to late prehistoric cultural dynamics at the interface of the Andes and the Amazon and support the general model of precolumbian dispersal patterns developed by Donald W. Lathrap over 40 years ago.

[221]

Chair

Siegert, Courtney (Texas State University), Nicholas Herrmann (Texas State University) and Todd Ahlman (Texas State University)

[215]

Geophysical Investigations of Historic Plantation, Military, Institutional, and Cemetery Sites on Sint Eustatius

Sint Eustatius served as a free port in the late seventeenth century, enabling the island to prosper in a evolving global economy. To better understand the role Sint Eustatius played in globalization, archaeological assessments have occurred at SE094 (Fort Amsterdam), SE095 (historic plantation), SE127/410 (Lazaretto), and SE600 (unmarked cemetery). These investigations were conducted to locate the extent and integrity of any prehistoric and historic archaeological sites on the property for continued preservation. Geophysical investigations, including ground penetrating radar (GPR) and gradiometry, were conducted in 2017 and 2019 to locate subsurface structures or features, including the possible location of the village associated with the plantation's enslaved community. GPR data was collected using a 400 mhz antennae and the gradiometer data was recorded using a single

axis fluxgate gradiometer. Although most commerce on the island revolved around free trade, several plantations were in operation on the island and were largely supported by the enslaved community. This data contributes to our understanding of site use and the role the plantation played during the colonial period and provides insight into the lifeways of the individuals which contributed to the island's wealth.

Siebert, Courtney [215] see Karastamatis, Kallista

Sievert, April (Indiana University)

[248]

Learning NAGPRA: People, Process, and Product

The Learning NAGPRA Project brought together scores of people from across the country to study, discuss, collaborate and develop curriculum for assisting in teaching and learning about the Native American Graves Protection and Repatriation Act (NAGPRA). Surveys of students, educators, museum professionals, and the Register of Professional Archaeologists indicate that, although there are abundant resources for learning about the law, there has been less attention paid to curriculum to addresses both the ethical underpinnings of the restorative justice that NAGPRA can affect and the practicalities of compliance. During the NSF-supported Learning NAGPRA project, tribal professionals worked with non-tribal scholars in every phase of the research, and convened three collegium meetings—workshops that supported the discussions about curriculum design. We now introduce the general format of the materials developed, and the process for accessing them through a Learning NAGPRA website at Indiana University, Bloomington.

Sievert, April [172] see Pope, Melody

Sillar, Bill [127] see Ogburn, Dennis

Silliman, Stephen [112] see Carr, Sarah

Silva, Fabiola and Lorena Garcia (Universidade Federal de Sergipe)

[161]

Landscapes of the Mid-Low Xingu: Archaeology, Temporality, and Longue Durée Indigenous Stories

This presentation deals with the archaeological research carried out in the indigenous land Koatinemo, together with the Asurini do Xingu indigenous people. From this experience, a reflection on the temporality of the landscapes and on the *longue durée* indigenous stories of the mid-low Xingu region was performed. Two horizons of reflection were combined on the approach. The first one deals with persistent places interconnected with the experience of living in the places, the contact with the historical narratives and the Asurini's oral tradition. The second one concerns the artifactual landscape that has been materially transformed over the time and consists of visible marks left by different human activities throughout the time. In methodological terms, the study applies techniques of archaeological survey and analysis of ceramic collections from the identified archaeological sites in the referred indigenous land. At the end, the communication presents a contribution on current knowledge about the indigenous ancestry of the landscape and the way it is related to the history of the Asurini and of the populations of Juruna and Karib languages from the mid-low Xingu.

Silva Sifuentes, Jorge (Museo de arqueología y antropología UNMSM), Victor Paredes Castro, James Quilca and Maria Lozada (University of Chicago)

[268]

La expedición de Toribio Mejía Xesspe en la cuenca del Río Ocoña

En 1943 Toribio Mejía Xesspe visitó Camaná y Ocoña para reconstruir los hechos ocurridos durante el descubrimiento de Corral Redondo en 1943. Esta visita fue hecha por encargo de Julio C. Tello, quien en ese entonces era el director del Museo de Antropología. Tello tuvo interés en el evento y también en recuperar los materiales del sitio. En esta ponencia daremos a conocer detalles de esta expedición basados en los inéditos cuadernos de campo de Mejía Xesspe. Estos no solo ofrecen una detallada narración de los hechos, sino que también reflejan una visión propia del clima arqueológico de la época.

Silverstein, Jay (Univ. of Tyumen), Robert Littman (University of Hawaii, Manoa), Dora Goldsmith (Freie Universität Berlin), Sean Coughlin (Humboldt-Universität zu Berlin) and Stacey Bagdi (Ludwig Maximilian University of Munich)

[192]

Uncommon Scents: The Greco-Roman Perfume Industry at Thmuis, Tell Timai, Egypt

Ancient sources reference the quality and importance of perfume manufactured in the Mendesian nome through the periods of Hellenistic and Roman control of Egypt. Archaeological evidence has identified areas of manufacture for lekythoi and possibly for the perfume itself at the site of Tell Timai. Sourcing analysis has demonstrated that special clay was imported from a great distance suggesting an extensive network of trade and possibly an investment in the magical properties of perfume bottles. Experimental archaeology has resulted in the recreation of the Mendesian perfume bringing the famous fragrance back to life. A picture of an extensive multinational network involved in the manufacture, marketing, and distribution of Mendesian perfume indicates an industry that spanned the Mediterranean world.

Simbine, Celso (Eduardo Mondlane University)**[250]***The Maritime Archaeology of Mozambique Island: Lessons from the Commercial Gathering of Beads and Porcelain for Tourists*

This paper presents the results of the archaeological survey of porcelain sherds and beads that were collected on beaches around Mozambique Island. This assemblage represents a long history of maritime interactions dating to at least the fifteenth century initially focused on the Indian Ocean, but eventually also encompassing the Atlantic. It first describes the collected assemblage (which includes significant representation from the Ming Dynasty (Wanli period fifteenth to sixteenth centuries) and Qing Dynasty (seventeenth to twentieth centuries), seventeenth to nineteenth century European wares). It then develops an inventory of site-formation processes including shipwrecking events, regular harbor activities, and, since the 1960's, the removal and sale of artifacts to tourists. Then, the paper explores how each affects the relative presence and distributions of artifacts in the archaeological record in particular ways ultimately with significant implications for preserving the cultural heritage of the Mozambique Island.

Simborth, Erika, Hans Barnard (UCLA) and Alex Badillo (Indiana State University)**[268]***The Archaeological Survey and Settlement Pattern of the Ocoña and Chorunga Valleys*

In 2018 and 2019, an archaeological survey was performed in the region near the confluence of Río Chorunga and Río Ocoña in the province of Arequipa in southern Peru. The newly collected geospatial data and drone imagery were digitally combined with existing topographical, geological maps, and declassified satellite imagery. In the direct surroundings of the confluence, six ancient sites were identified and located: Ancha, Corral Redondo, ancient Iquipi, Jarana Oeste, La Victoria, and Llokla. Other Prehispanic sites were recorded in the upper Ocoña Valley: Ispana, Santa Rosa, Piquillay, three settlements with associated cemeteries, Callanga, a large Inka settlement, and Allanka. Additional sites were documented further east in the Chorunga Valley: Jarana Este, Quebrada San Pedro, Chillihuay Oeste, Chillihuay 1, Chillihuay 2, Chillihuay Pukara, Gramadal, and Rosario. At Chillihuay 1 and 2 are numerous elaborate petroglyphs, likely dating to the Middle Horizon. Modern construction, mining activities, flooding events, and erosion appeared to have severely damaged the ancient structures at many of these sites. While our survey is not yet complete, the recorded sites provide information about the Prehispanic occupation in the Ocoña and Chorunga Valleys.

Simborth, Erika [268] see Lozada, Maria

Simek, Jan, Erin Pritchard (Tennessee Valley Authority), Alan Cressler, Johannes Loubser (Stratum Unlimited) and Sierra Bow (University of Tennessee, Knoxville)**[60]***Precontact Cultural Landscapes at Painted Bluff, Alabama*

The Mississippian period rock art site at Painted Bluff, Alabama (1MS394) is one of the most complex, beautiful, and impressive rock art localities in Eastern North America. The number and diversity of its images rivals the dark zone cave art sites of the region, with 137 individual images so far recorded, all pictographs but for a handful of petroglyphs. Many of the images reflect known religious iconography from Mississippian times: bird-humans, dancers, animals, and shape-shifters are all depicted. Perhaps most impressively, the paintings and engravings are organized on the face of a massive limestone cliff more than 100 m high. The glyphs are disposed into three elevation echelons, each one reflecting a different aspect of the Mississippian cosmos. In short, Painted Bluff is a dominant natural landscape feature transformed by rock art into a cultural landscape, one that reflects religious canon on a very large geographic scale. In this, it is part of a wider precontact cultural landscape modified through rock art. This paper will discuss the art and its context, its structural organization, and efforts that have been carried out, in consultation with a number of descendant tribal groups, to document, protect, and conserve this important locality.

Simmons, Alan (University of Nevada, Las Vegas; Desert Research Institute, Reno) and Renee Kolvet (Independent researcher)**[199]***Wood, Grapes, and Meds: Ground Stone Residue Evidence from Neolithic Ais Giorkis, Cyprus*

Residue analyses from ground stone artifacts have proven to be a powerful tool for fine-tuned resolutions of many economic issues. While frequently incorporated into archaeological interpretation, this method is relatively new to the island of Cyprus. Here we report on the results of a small number of residue washes from Ais Giorkis, an upland site in the Troodos Range. Pollen, phytoliths, and starch residues suggest diverse activities and practices directly or indirectly linked to the forest. These include the use of wooden pestles for food and condiment processing, possible evidence of grape consumption, and use of traditional ethnomedicines. Of particular interest are elevated levels of Caryophyllaceae pollen from a grinding slab. Plants in this family are known for their anti-viral, anti-bacterial, and anti-inflammatory properties and are being studied in modern cancer research. While the current samples are too small to draw conclusions about early winemaking or knowledge of medicinal remedies, further investigations at Ais Giorkis and contemporary Cypriot occupations will expand on these findings. The results will be articulated with other data to help establish Ais Giorkis' role in early Cyprus and within a wider landscape examining the spread of Neolithic concepts from their continental cores to the Mediterranean islands.

Simmons, Wilson, John Dudgeon (Idaho State University) and Sara Getz (Idaho State University)**[80]***Age Estimation of Pathological Dentition Using Cementochronology*

In archaeology and forensic anthropology, dental methods for estimating age-at-death are often less reliable in adults, particularly those over 50 years of age because the techniques primarily rely on developmental processes (e.g., tooth eruption) that are completed by the late twenties to mid-thirties. One exception is cementum, the material that covers the root surface of teeth, which continues developing throughout one's lifetime in uniform layers called tooth cementum annulations (TCA). The purpose of this

research is to test the accuracy of an age estimation method using TCA, also known as cementochronology, on dentition from modern individuals of known ages, particularly its applicability to pathological teeth. A transverse section of the root of each tooth is mounted on a slide and examined under a microscope so the annulations can be counted. Then, these are added to the average age that each tooth begins development, providing the estimate. The sample consists mostly of teeth extracted from individuals by their dental professionals in and around Pocatello, Idaho as well as some taken from anatomical donors at Idaho State University. Cementochronology is promising because of its potential to be applied to mature individuals and it is simple enough to be performed by inexperienced researchers.

Simon, Mary, Kristin Hedman (Illinois State Archaeological Survey) and Mathew Fort (Illinois State Archaeological Survey)
[233]

Possible Sources for 14C Enrichment in Archaic and Woodland Populations of the Midwestern United States

Carbon isotope ratios obtained on skeletal material from pre-AD 400 populations in the Midwest often return ratios that suggest a slight elevation in heavy carbon. Because these are pre-maize eating groups, the source of enrichment is an ongoing question. Here we present information from ongoing food web studies and new plant isotope data that sheds light on the source of enriched carbon in diets and contend that it is not due to any level of maize consumption at this early date.

Simon, Rebecca (History Colorado - OAHP)
[43]

Discussant

Simon, Rebecca (History Colorado - OAHP)
[154]

Discussant

Simon, Rebecca (History Colorado - OAHP)
[193]

Discussant

Simova, Borislava (Tulane University)
[158]

Formal Architecture and Standardized Practice: Tracing the Relationship between E Groups and Ritual Practice at the Site of Actuncan, Belize

One of the earliest known examples of permanent architecture in the Maya Lowlands, a distinctive plaza-structure complex known in the literature as an E Group, is also one of the most commonly encountered architectural groups present within Preclassic sites throughout the region. The rapid adoption of the construction and widespread standardization in form suggest incredible intraregional integration within the Lowlands, but the nature of this integration remains an important topic of discussion. This presentation reviews techniques and data generated from the E-Group at the site of Actuncan, located in the Mopan River Valley of Belize. The research addresses the articulation between emergent permanent, large-scale architecture and formal patterns of practice. The construction history of Actuncan's E-Group indicates the presence of local antecedents to the formal complex. This offers an opportunity to study the changing arrangement and uses of the constructed space and develop a case study for the adoption of E-Group architecture and associated ritual practice in the Mopan River Valley.

Simpson, Diana (University of Nevada, Las Vegas)
[131]

Beyond the Brutality: Ritualized Violence in the Archaic Period Southeast

The Archaic Period of the Southeastern U.S. is characterized by major environmental and ecological changes which likely stimulated ideological changes visible in the archaeological record. This period also demonstrates widespread direct violence which transcends ecologically based explanations. In particular, the contradictory lack of defensive architecture in tandem with compounding evidence for widespread trophy taking and killings, suggest a deeper meaning behind these violent actions. Focusing on shell burial mound sites within the Middle Tennessee River Valley of Alabama, this research investigates how violence emerged and was ritualized during the Archaic Period, and how this contributed to transformations in broader cultural processes within these groups. As a student of Dr. Martin, I am constantly encouraged to employ a well-rounded multidisciplinary approach, using a fine-grained biocultural analysis to interrogate ritual violence in a more nuanced way focusing on lived experience, performance, and culturally-specific patterns. This approach to research which Dr. Martin embodies and trains her students in, allows my work to make significant contributions both to our understanding of how ritual violence was enacted within these Southeastern groups, and to a growing anthropological literature on the complex ways that ritual violence is embedded in ideology and daily practices through time and space.

Sincerbox, Susan [76] see Jacobson, Jodi

Sinclair-Thomson, Brent [60] see Challis, Sam

Sinensky, R. J. [148] see Berner, Jack

Singer, Zachary (Towson University)**[13]***Paleo Pale Ale: Reflections on Connecticut Paleoindian Studies with Dr. Brian Jones*

In 2012, Dr. Brian Jones brewed "Paleo Pale Ale with genuine cattail root" to celebrate Dick Boisvert and SCRAP's Octoberfest excavation of a Paleoindian site in Jefferson, New Hampshire. The 2012 excavation marked ~20 years (1992) since Brian located and excavated the Late Paleoindian Hidden Creek Site, which was just the third Paleoindian site to be documented in Connecticut. His dissertation "Human Adaptation to the Changing Northeastern Environment at the End of the Pleistocene" published in 1998 solidified him as a Paleoindian expert. Beginning in 2010, Brian served as my mentor and as a member on my dissertation committee at UConn teaching me proper techniques for locating, excavating, and analyzing Paleoindian sites. This presentation discusses Brian's contributions to Paleoindian studies in Connecticut as both an expert Paleoindian researcher and a mentor.

Singh, Ravindra [272] see Bates, Jennifer

Singleton, Robin (University of Oklahoma), Nihan Dagtas (University of Oklahoma), Karissa Hughes (University of Oklahoma), Nawa Sugiyama (University of California, Riverside) and Courtney Hofman (University of Oklahoma)**[244]***Captive Management and Sacrificial Power: Using Ancient Genomics to Study Animal Sacrifice in Teotihuacán*

Excavations of the Moon and Sun Pyramids (1998–2004) at Teotihuacán have yielded both human and animal sacrifices interred as part of state rituals. These rituals demonstrated the power of the state, and the species chosen reflected that power. Isotopic and zooarchaeological analyses of the sacrificed animals show that some of them were held for extended periods of time before their deaths—they have skeletal lesions associated with restraints and evidence of maize based diets—while others were sacrificed fairly quickly. We conducted genomic analysis on golden eagle (*Aquila chrysaetos*) remains that were sacrificed and interred in Teotihuacán to determine the relationships among sacrificed individuals, and we compared them with extant populations. These relationships provide insight into how the eagles were procured and managed before sacrifice. By investigating the resource cost for obtaining and keeping these animals for sacrifice, we can improve our understanding of the ritual economy in Teotihuacán and the greater Mesoamerican region.

Sinopoli, Carla (University of Michigan)**[88]***Discussant*

Sipes, Eric [193] see Gordon, Falcia

Sirak, Kendra (Department of Genetics, Harvard Medical School) and Jakob Sedig (Department of Genetics, Harvard Medical School)**[173]***Exploring Male Sex Bias in Ancient DNA Research*

Preliminary research and anecdotal evidence suggest that there is an overrepresentation of male samples relative to female samples in published ancient DNA research; however, the reason behind this bias is poorly understood. In this paper, we quantify this sex bias within an ancient DNA database of 3,365 individuals for whom sex was reliably assigned. We compare sex calls made using molecular methods to osteological sex assessments, exploring their rate of agreement. We find that ~58% of individuals were sexed as male using molecular methods, and that this is most often consistent with the osteological assessment. We then explore possible explanations for male bias, including some discrepancy between osteological and genetic sex calls that introduces an unforeseen bias, superior preservation of more robust male skeletons, preferential burial treatment of male individuals in the past (e.g., males buried in more prominent positions), intentional sampling bias introduced by researchers (e.g., preferencing male individuals in order to obtain Y chromosome data), and a higher sequencing success rate for male individuals for reasons that are unclear. This research aims to clarify if male over-representation is the result of research design and methods, and therefore correctable, or reflective of ancient cultural practices.

[173]*Chair*

Sitdikov, Airat [173] see Flegontov, Pavel

Sitek, Matthew (UC San Diego)**[105]***Communities in the Campo: Household Excavations at a Tiwanaku Frontier Settlement in the Middle Locumba Valley, Peru (ca. AD 500–1100)*

In this paper I present preliminary findings from extensive household excavations at the large multi-component site, Cerro San Antonio (L1), in the middle Locumba Valley in southern Peru. While the site represents a valuable dataset for nearly all periods of Andean prehistory, this current research has targeted domestic remains with clear affiliations to the Tiwanaku polity, which influenced much of the south-central Andes during the Middle Horizon (ca. AD 500–1100). Defined by three separate domestic sectors, the Tiwanaku occupation at Cerro San Antonio appears to be one of the largest settlement enclaves outside Tiwanaku's highland center over 200km away in Bolivia. Taking a holistic approach to the domestic assemblage this paper will present initial

results from ceramic, lithic, faunal, botanic, and textile analysis coupled with detailed built environment and other context-driven spatial data. Excellent material preservation, shallow deposits, and a detailed, micro-context excavation strategy has yielded an unprecedented view into the domestic activities and community practices which defined the daily lives of the site's Middle Horizon occupants. This will be a powerful comparative dataset for those studying the Tiwanaku polity and daily life in the ancient Andes more generally.

Sitek, Matthew [267] see Garvin, Arianna

Sitek, Matthew [243] see Huggins, Kathleen

Sitek, Matthew [61] see Santillan Goode, Julianna

Skaggs, Sheldon (Bronx Community College CUNY), Terry Powis (Kennesaw State University) and George Micheletti (University of Central Florida)

[197]

Be Thine Own Palace: Courtyard Developments and Transformations at the Ancient Maya Site of Pacbitun, Belize

Palaces are a constant feature of ancient Maya society. While they have been studied for decades, their origins remain somewhat obscure. We are interested in their location within Maya site centers—why spot X as opposed to spot Y—which remains unclear at many sites, as do the social, political and even practical factors which surely dictated such choices. For the palaces in the courtyards at Pacbitun we see a shift in focus through time whereby initial public/communal space in the Middle Preclassic was deliberately transformed into private/non-communal space by the Classic period. With one architectural alteration the same space switched from ceremonial to non-ceremonial. Why did this occur? By examining palatial architecture, courtyard stratigraphy, ceramic dates and associations, and radiocarbon assays from Pacbitun's three courtyards we hope to identify the nature, extent, and structure of palace development from Middle Preclassic through Terminal Classic times.

Skibo, James (Illinois State University)

[255]

Pots and Sherds: Closing the Gap and Surviving the Zombie Apocalypse

There is a methodological and analytic gap, according to Alan Porter Sullivan III, between the work of prehistorians and ethnoarchaeologists. At the core of this analytical divide, particularly among those who study ceramics, is the simple fact that prehistorians most often find and analyze sherds, and ethnoarchaeologists focus on whole vessels. Al Sullivan has explored this analytical gap, and at times suggested that most of ethnoarchaeology is unusable to the prehistorian. However, he has discussed some possible ways to mend this gap, focusing particularly on the formation of ceramic assemblages. I explore some of Sullivan's remedies, add some of my own, but then conclude with a discussion of the true value of ethnoarchaeology—surviving the zombie apocalypse.

Skinner, Dougless, Whitney McLaren (Center for the Environmental Management of Military Lands), Barrett Flynn (Center for the Environmental Management of Military Lands) and Julie Esdale (Center for the Environmental Management of Military Lands)

[52]

A Look into Modern and Prehistoric Land Use on Army Managed Lands in Alaska

Prehistoric site locations are often ideal places for modern activities. This is especially true in the Jarvis Creek Archaeological District on Fort Wainwright, where army training activities, development, and recreation regularly take place in and around shallowly buried archaeological sites. In this case study we use GIS methods to examine: the success rate of archaeological surveys using shovel testing; the relationship between initial site discovery and site size deduced from NRHP evaluations (Phase II investigations); and the intersection of modern trails and campsites with inferred prehistoric ones. GIS modeling based on terrain features, vegetation, and proximity to water coupled with lithic assemblage characteristics has implications for prehistoric subsistence practices and technological organization. Results from these analyses will aid in the interpretation of the lifestyles of early Alaskans and better management and protection of archaeological sites on active training lands.

Skinner, Jane (Pennsylvania State University) and Ann Killebrew (Pennsylvania State University)

[234]

A Phoenician Iron Smithy at Tel Akko, Israel

This paper presents the results of the excavation and analysis of an extensive iron industrial area (smithy) of unprecedented size dating to the sixth–fourth centuries BCE (Persian period) at Phoenician Tel Akko, Israel. This 22-hectare commercial and industrial harbor town connecting the Mediterranean Sea with the Levant has dominated the Plain of Akko's ancient landscape for four millennia. Current excavations of the Tel Akko Total Archaeology Project (2010–present), directed by A.E. Killebrew and M. Artzy under the auspices of the University of Haifa and the Pennsylvania State University, focus on the late Iron Age and Persian period (ca. eighth–early fourth centuries BCE) Phoenician city in Area A at the summit of the tell. Here evidence of iron-smithing such as iron slag, hammer scales, hearths and tuyeres have been uncovered. Installations and artifacts related to cultic activity have been identified near these industrial areas. This mid-first millennium smithy, the only known large-scale iron working facility in the Levant dating to the Persian period, provides an unparalleled opportunity to explore iron production at a Phoenician maritime center in its broader Near Eastern context.

Skipton, Tara [18] see Hollingshead, Analise

Skowronek, Russell (University of Texas, Rio Grande Valley) and Juan Gonzalez (University of Texas, Rio Grande Valley)
[126]

From Miocene Volcanoes to Spanish Colonial Missions: Ron Bishop's Contributions to the Prehistoric Archaeology of Texas and the Historical Archaeology of California

How does research happen? It can present itself or we can seek it. Either way it will succeed or fail based more often on serendipity and personality of those involved. More than twenty years ago Ron Bishop returned to his childhood home in California and initiated a research project examining ceramic production in Hispanic California. That work led to the study of a 27-million-year-old, twenty-meter-thick volcanic ash deposit on the Texas-Mexico border, and a unique chert that formed from it, and was quarried and used by native Americans for ~10,000 years. This two-part presentation will tell a little-known aspect of Bishop's important role in research beyond the periphery of Mesoamerica.

Skowronek, Russell [6] see Gonzalez, Juan

Slade, Alan [198] see Taylor, Ian

Slane, Brittany (Idaho State University), Samantha Blatt (Idaho State University) and Mary Thompson (Idaho Museum of Natural History)
[76]

Dogs by Number: Geomorphometric Differentiation of Canid Species

The relationship between humans and canids is temporally deep and complex. Canid species from prehistoric contexts are often identified using subjective macroscopic observations of morphological traits. However, accurate species identification from skeletal elements is challenging as remains are often incomplete, highly fragmentary, and absent of diagnostic features. Misidentification of species from prehistoric contexts can inhibit interpretations of canid evolution, behavior, and human-canid interaction in the past. Therefore, objective and statistical methods of identification are needed. This project analyzes co-variance matrices of size and shape of radii, femora, mandibles, and carnassials (N=327) from adult specimens of four canid species (*Canis lupus*, *Canis latrans*, *Canis familiaris*, and *Vulpes vulpes*) from Pleistocene-Holocene, Idaho. Size variance is assessed from principle component analysis (PCA) of 15 measurements. Shape variance is assessed from landmark analysis, MANOVA, and PCA of 16 reproducible, digital 2D geomorphometric points of the same elements. Results of PCA indicate distinct clustering of elements by species. (M)ANOVA validated the difference in metrics and morphometrics between species. Applying metric and morphometric analyses as vectors using these skeletal elements is useful for identification of canid species from archaeological and paleontological contexts in the Intermountain West.

Slatowski, Jenna and Lori Lee (Flagler College)
[3]

Low-Fired Ceramic Chronologies at Fort Mose

Fort Mose was the first free black settlement in the United States, built in Spanish territory on land previously occupied by the Eastern Timucuan. This paper explores the ceramics of Fort Mose and delves into the chronology of site use based on ceramic types. Indigenous ceramics and colonoware provide insight into the presence and cultural interaction of different cultural groups at Fort Mose. By considering the prehistory and history of the indigenous peoples in the area and free African Americans who lived at the Fort, we can piece together the social and economic contexts of ceramic producers and users.

Slaughter, Michelle (Alpine Archaeological Consulting) and Kevin Gilmore (HDR)
[78]

Grandpa's Little People: Two Prehistoric Ceramic Figurines from Atascosa County, Texas.

In 2011 the lead author inherited a portion of her grandfather's collection of prehistoric artifacts he acquired from cultivated fields surrounding his home in Pleasanton, south of San Antonio. Although the provenience of these artifacts cannot be determined conclusively, we believe they represent collection from a relatively limited geographic area, and the culturally diagnostic artifacts are consistent with a south central Texas provenience. Among the artifacts in this box were two small anthropomorphic ceramic figurines. One of these is mostly complete and is 9cm in size, while the other is broken with only the head present. These two objects are stylistically very similar, and both are depicted with vertical headdresses, large ear spools, and prognathous faces (or snouts) with somewhat cursorily rendered facial features. A literature search of a broad geographic region did not find any analogs, and no similar artifacts were found in the literature of Texas archaeology. Superficially they are stylistically similar to some Mississippian figurines. This poster and the actual artifacts are being brought to the SAA meeting to provide an opportunity for the Texas archaeological Hive Mind to examine them and provide insight as to the origin, function, cultural and temporal association of these artifacts.

Slaughter, Michelle (Alpine Archaeological Consulting)
[154]

Discussant

Slaughter, Michelle [214] see Larkin, Karin

Sload, Rebecca
[137]

Beyond Chicomoztocs: Are Hill Sign Toponyms Actually Mountain-Caves?

Among the ancient central Mexican highland cultures of the Aztec, Mixtec, and Zapotec, the hill sign toponym was an important standardized definition of place. The hill sign itself was a constant, that was embellished with one or more glyphs characterizing the place. Chicomoztocs, one type of hill sign toponym, have been recognized for decades as mountain-caves. Referring to the seven caves from which emerged the seven major central Mexican groups, Chicomoztocs are hill signs embellished with seven caves. This presentation raises the question of whether many, perhaps all, hill sign toponyms are in fact mountain-caves. I illustrate the possibility with examples of non-Chicomoztoc hill sign toponyms that are clearly mountain-caves. The argument is bolstered by the eternalness and centrality of the mountain-cave in ancient Mesoamerican cosmology. The analysis suggests that hill sign toponyms may be more accurately labeled mountain-cave toponyms.

Sloan, Anna (University of Oregon) and Annie Caruso (University of Oregon)

[160]

Using Ethnographic Methods in Decolonizing Archaeological Practice: Two Examples from Community-Based Projects in the Americas

Recent archaeological scholarship has explored the long and often fraught relationship between archaeology and ethnography while also assessing the productivity of their continued intersections. In this paper, we propose that ethnography, when used critically and carefully, is still relevant to archaeology and can in fact contribute to decolonizing practice. To demonstrate, we present two examples of community-based archaeological research that utilize ethnographic methods to unsettle colonial paradigms. First, Sloan discusses ethnoarchaeological modeling of gendered and social materialities in an Alaska Native community. Here, ethnographic field work provides information about Indigenous philosophies of gender, sociality, and materiality that then inform interpretations of ancestral social life at a pre-contact village, while also helping ground the research in community priorities. In our second example, Caruso presents research from the transdisciplinary field of ethnocritical archaeology, which serves to develop in-situ ethical engagement with source communities by critically evaluating the research process itself. Such methods are applied to a Euro-American-operated excavation of Indigenous settlements in the Eastern Caribbean, wherein Afro-Antillean source community input are utilized to construct recommendations for archaeological reforms and forge a model of cultural competency for visiting researchers.

Slotten, Venicia (University of California, Berkeley)

[157]

Prehispanic Life and Foodways in the Arenal Region, Costa Rica: Resilience at La Chiripa

Arenal has been the most active volcano in Costa Rica in recent history. Archaeological studies show that people have been living within the Arenal region for several thousand years, demonstrating their impressive ability to adapt to life in a volcanically active landscape. Paleoethnobotanical work on household contexts within this region reveals what subsistence strategies prehispanic peoples incorporated into their daily lives in order to thrive in an ever-changing environment. Macrobotanical samples collected from La Chiripa, a site buried by multiple Arenal eruptions over a span of 3,000 years, records the human-environmental interactions that contributed toward the longevity of cultural practices in this region. Analysis of the preserved botanical remains at this site suggest the roles that plants occupied in ancient Costa Rica, whether that was for food, medicine, fuel, tools, clothing, or construction material. Identified macrobotanical remains from La Chiripa include maize, beans, tubers, various Asteraceae achenes, many wild seeds, and abundant wood charcoal remains.

Smallwood, Ashley (University of Louisville), Thomas Jennings (University of Louisville), Heather Smith (Eastern New Mexico University) and Charlotte Pevny (SEARCH Inc.)

[17]

Geometric Morphometric Analyses of Beveled and Serrated Late Paleoindian Dalton Points from the Heartland

In eastern North America, the Late Paleoindian Dalton period marks an important transition in projectile point technology. For the first time, hunter-gatherers modified point blade margins with serrations and beveling, techniques that persist in the record into the early Holocene. Recent advancements in geometric morphometrics analyses offer new methods to help understand the functional and evolutionary implications of these changes. In this paper, we briefly review recent approaches to studying variation in shape and form in Paleoindian projectile points and highlight technological and morphological traits that might serve as useful variables for understanding functional and historical relationships. We then apply geometric morphometrics to a sample of points from the Dalton Heartland to characterize aspects of Dalton point technology.

Smallwood, Ashley [232] see Jones, KC

Smeeks, Jessica (Binghamton University)

[105]

Enemies and Allies: GIS Analyses of Late Intermediate Period Defensibility and Settlement Patterns in the Huamanga Province of Peru

Warfare theorists argue that scholars must move beyond social evolutionary theories and realize that warfare and sociopolitical organization are not autonomous and self-regulating; one cannot be understood in isolation from the other. Instead, scholars need to focus on the interrelationships between and interdependency of military infrastructure and societal structure. Only through the analysis of this interrelationship can scholars begin to understand warring societies across time and space. The Peruvian Late Intermediate Period (LIP) (AD 1000–1450), the period between the collapse of the Tiwanaku and Wari States and the rise of the Inca Empire, is an ideal time period to study this relationship, as it has often been characterized as a time of violent conflict and social strife. This paper uses Geographic Information Systems (GIS) analyses to consider how defensive practices and regional site organization changed throughout the LIP in the former core of the Middle Horizon (MH) (AD 600–1000) Wari Empire—the Huamanga Province of Ayacucho, Peru. GIS analyses at the regional level evaluate the relationship between hilltop sites, examining

spatial distribution, ceramic distributions, and intervisibility. Meanwhile, site level analyses assess defensibility at 12 LIP sites, focusing on movement analysis (accessibility) and visibility analysis (visual range and invisibility to outsiders).

Smit, Douglas (University of Pennsylvania)

[32]

Discussant

Smit, Douglas (University of Pennsylvania) and Charlotte Williams (University of Pennsylvania)

[57]

Digital Storytelling and Dark Heritage: Presenting Photovoice in Huancavelica, Peru

This paper discusses a recent Photovoice project that examined cultural landscapes of colonial-period mercury mining at Huancavelica, Peru in collaboration with the descendent community of Santa Bárbara. The Peruvian Ministry of Culture recently placed Huancavelica on the UNESCO tentative list, rapidly expanding discussions of cultural heritage among local officials, tourism operators, and the Santa Bárbara community. This interplay between local, national, and global scales contains multiple narratives of colonial-period heritage, ranging from discourses of progress and technological advances in metallurgy to darker histories of colonial violence and environmental catastrophe. Beginning in 2018, we initiated a Photovoice project to understand how the people of Santa Bárbara engaged with different heritage narratives, culminating with a photography exhibit and community heritage event in 2019. In this paper, we critically analyze how our presentations of Photovoice engaged with community and local heritage institutions, and discuss ongoing collaborations to develop a website that combines digital storytelling with oral histories and archaeological research.

Smith, Alexander (College at Brockport, SUNY), Linda Gosner (University of Michigan), Jessica Nowlin (University of Texas, San Antonio), Seth Price (University of Arkansas) and Catalina Mas-Florit (Universitat de Barcelona)

[35]

Multi-Scalar Survey in Agrarian Sardinia: Results from the 2019 Season of the Sinis Archaeological Project (Sardinia, Italy)

The Sinis Archaeological Project (SAP) investigates the landscapes of the Sinis Peninsula and portions of the Campidano di Milis in West-Central Sardinia, focusing on understanding the areas surrounding such famous archaeological sites as Nuraghe S'Urachi, Tharros, and Monte Prama. The region is known for its rich archaeological landscape, but excavation has been more common than landscape survey. Striving to fill this gap, SAP is dedicated to understanding and documenting occupation and use of these dynamic landscapes from antiquity to the modern era. Since 2018, SAP used multi-scalar survey to investigate the area immediately surrounding the Bronze Age site of S'Urachi (Zone A), a low-lying plain used for agriculture and pastoralism, the first of four planned zones of intensive survey in the wider region. These methods included pedestrian fieldwalking and features recording, complemented by satellite-based Normalized Differential Vegetation Indices (NDVI), drone-based landscape imagery, and photogrammetry. Our survey has provided a wealth of high-resolution data that clarify the diachronic occupation of the landscape around S'Urachi and its use for agrarian purposes. This poster presents the preliminary results of survey in Zone A and plans for expanding SAP in 2020 to Zone B, located in the northwestern coast of the Sinis Peninsula.

Smith, Benjamin (University of Western Australia)

[111]

Chair

Smith, Byron (University of Texas, Austin), Stanton Morse (Humboldt State University), Marisol Cortes-Rincon (Humboldt State University), Timothy Beach (University of Texas, Austin) and Sheryl Luzzadder-Beach (University of Texas, Austin)

[230]

Exploring Soil and Nutrient Distribution at the Hinterland site of Yax Ch'am in Northwestern Belize

Previous studies at Yax Ch'am in the hinterlands of northwestern Belize suggests the site represents a Late Classic, collaboratively organized, specialized community, centered around terraced-based agronomy. While those studies have indicated a complex network of cultivation and water management systems, little attention has been focused on the distribution of soils and nutrients across the landscape. The recent availability of high-resolution digital elevation models based on light detection and ranging (lidar) have renewed interest in the landscape surrounding the site. As a result, this project sought to delineate soil and nutrient distributions around Yax Ch'am through an analysis of the terrain's natural and anthropogenic features, as well as its soil hydrology. The methodology for this project involved both field and laboratory analysis, which included geographical information system (GIS)-based terrain modeling, pedestrian survey, excavation, and a systemized soil sampling strategy, as well as a multi-elemental analysis of soil samples based on inductively coupled plasma mass spectrometry (ICP-MS). While laboratory analysis is still ongoing, early results indicate limited permeability of anthropogenic features which may suggest the reliability of terrace retaining wall features.

Smith, Byron [230] see Morse, Stanton

Smith, Charles

[132]

How One Archaeologist Went from Fieldwork to Collections Management, the Iraq War, and Vietnam to Preserve, Protect, and Educate

The 48 year career of Dr. Michael K. (Sonny) Trimble is a sterling example of how an archaeologist, who began his career doing fieldwork, museum and archives work, and lithic analysis, became a leader and innovator. He has had a significant impact on the U.S. Army Corps of Engineers (Corps), other Federal agencies, the archaeological profession, and our Nation's community of

veterans. The first half of his career provided Dr. Trimble with the “dirt and publications” kind of experience he would go on to apply to developing and implementing new ideas and programs for the management of the massive archaeological collections and documents held by the Corps and Department of Defense services. He established a Center of Expertise for the Management of Archaeological Collections, conducted fieldwork on mass graves in Iraq 2004–2007, excavated and brought home the remains of POW/MIAs from overseas missions, and made tremendous strides meeting the Corps’ NAGPRA responsibilities. This paper describes how Dr. Trimble’s dedication, tenacity, and creativity at key points in his career resulted in the many unique accomplishments described in this session that preserved, protected, and educated in unparalleled fashion.

Smith, Derek [271] see Ojeda Rodriguez, Elizabeth

Smith, Donald [60] see Hayward, Michele

Smith, Emily (University of California, Santa Barbara)
[254]

Twisted Lines: K-12 Diversity Education and the Role of Archaeology in Teaching the Past

As educators, archaeologists must confront the problematic ways in which the general public addresses the history and development of the human race. Diverse experiences and alternative pathways of development that appear intuitive to archaeologists are not reflected in public discourse. Uncritical group-think mentality and modernist views of progress are deeply embedded within the general public and go unchallenged in current primary and secondary education models. Racial intolerance in the United States can be attributed in part to the failure of the education system in challenging students to critically engage with the full scope of human diversity. Archaeology is uniquely situated to confront attitudes of value based on false ideas of progress, to introduce students to unfamiliar regions of the world, and to readdress the way the subject of human history is approached in the classroom. The aim of this paper is to spark conversation among archaeologists about the effect of history education on the development of social, political, and cultural attitudes. The situation of groups outside of their regional context in educational programs will be discussed using the framework of Egyptian history, and a consideration of the ramifications of the absence of subaltern histories will be presented.

Smith, Geoffrey (University of Nevada, Reno)
[195]

Discussant

Smith, Geoffrey [195] see Sturtz, Sara

Smith, Gerad (University of Alaska, Fairbanks)
[82]

Insights from Prehistoric House Construction: Change through Time in the Middle Tanana Valley, Alaska

The study focuses on the construction types of two prehistoric housepits dating ~1000 and ~2000 cal BP along Shaw Creek, in the Alaskan Interior. House types can be culturally indicative of subsistence stability, resource intensity, and social structure. While house types of the proto-historic period have been often described, the earlier shift to their adoption and change in the Alaskan interior during the past 2000 years has largely been understudied. House size dramatically increases in the region around 1000 BP, suggesting that the concept of the household familial unit shifts. This shift in household size may correlate with, and be a proxy of, the diffusion of the Dene dual kinship-based socio-political system into the area.

[82]

Chair

Smith, Heather (Eastern New Mexico University), Taylor McCoy (Eastern New Mexico University), Fanxiu Meng (Eastern New Mexico University), Laura Evans (Eastern New Mexico University) and Brendon Asher (Eastern New Mexico University)

[77]

3D Digital Curation of the Blackwater Draw Stone Tool Assemblage: Uniting Materials from the Clovis Type Site

Blackwater Draw Locality 1 is foundational in the study of Paleoindian adaptation in North America. Since its discovery in the 1920s, more than 20 different institutions have excavated various components of the site. As a result, parts of the lithic assemblage, including the projectile-point collections, reside in different facilities across the country. Thus, the biface assemblage has never been united under one roof and thorough analysis of the assemblage is incomplete. Faculty, Staff, and students from Eastern New Mexico University launched an endeavor to compile an exhaustive dataset of lithic bifacial artifacts from Blackwater Draw. Beginning with those artifacts curated at ENMU and the Texas Archaeological Research Laboratory, this research team set out to scan the entire bifacial collection using a structured light 3D scanner. Here we present an update on this multi-year project to digitally curate the Blackwater Draw lithic tool collection in three dimensions. Our goal is to scan artifacts housed at institutions across North America and unite the lithic tool assemblage in a digital venue. Discussion will focus on our own geometric morphometric analyses of the collection in 3D and the future digital accessibility of the collection to researchers from around the world.

Smith, Heather [148] see Baker, Caitlin

Smith, Heather [66] see McCoy, Taylor

Smith, Heather [17] see Smallwood, Ashley

Smith, Jaye and Jeffrey Clark (Archaeology Southwest)**[142]***Citizen Science in Action: Preserving the Ray Robinson Collection from the Safford Basin, Arizona*

In 2015, centenarian Ray Robinson wanted to find a permanent home for thousands of artifacts he collected from numerous sites in the Safford Basin, Arizona during the late 1950s and 1960s, including items from the famous Bonito Creek Cave Cache. Through a collaborative effort between Archaeology Southwest, Northern Arizona University and the Arizona State Museum, Ray's desire was realized shortly before his death. In 2018, Archaeology Southwest assembled a team of over 30 citizen scientists to prepare the collection and process the artifacts to a "repository-ready" state for permanent storage at ASM. During 2018/2019 lab sessions, the Robinson Collection Team, with the assistance of Archaeology Southwest's Preservation Archaeologists, inventoried and identified artifacts from the "Cork Site", a previously undocumented Salado site in the Safford Basin. The Safford Basin was a vibrant cultural crossroads in the late prehispanic era (1200–1450 C.E) and there are few documented collections from this region. Collections from this site and others represented in the Robinson Collection fill an important gap in Salado knowledge. This paper will give a brief overview of the history of the Ray Robinson Collection, the importance of citizen scientist participation, and the preliminary results of artifact processing of the "Cork Site" assemblage.

Smith, Jessica [37] see Way, Phylcia

Smith, Jolene**[95]***Moderator***[95]***Discussant***Smith, Jolene****[217]***Discussant***Smith, Karen (South Carolina Department of Natural Resources)****[56]***Celebrating the Design Work of Bettye J. Broyles*

Like many archaeologists, the late Bettye J. Broyles discovered what she wanted to do in her twenties while enrolled in college. It was there where Broyles's archaeological career began to take shape, and by summer of 1954 she had embarked on her first field school. Broyles went on to do archaeology in Georgia, North Carolina, West Virginia, Mississippi, and Alabama, eventually returning to her Tennessee roots in the 1980s. Indeed, the details of much of her life were penned by Hester A. Davis and featured in the aptly named book *Grit-Tempered: Early Women Archaeologists in the Southeastern United States*. My interests concern Broyles's pottery design work, only briefly described in *Grit-Tempered*. Though only one publication resulted from her efforts to reconstruct Southeastern paddle stamped designs—an article that appeared in a Southeastern Archaeological Conference Bulletin—Broyles's design work has served as a legacy and inspiration to those who have followed. In this paper, I discuss Broyles's approach to design reconstruction, and some of the insights she gleaned from it. I then describe recent work on a software program that seeks to reveal the design patterns that Broyles so carefully documented.

Smith, Kevin (Haffenreffer Museum, Brown University) and Guðmundur Ólafsson (National Museum of Iceland)**[50]***Of Monsters and Men: Using Material Culture to Track Movement and Symbolism inside Surtshellir, a Western Icelandic Viking Age Ritual Site*

Over the course of 850 years Surtshellir—a massive lava cave in western Iceland's rugged interior—has been variously described as a geological wonder, a shelter for outlaws, an abode of ghosts and spirits, a tourist's dream, a place of torture, the wilderness, an archaeological site, and the home of Surtur—destroyer of gods and men. Focusing on data gained from work inside the cave in 2001, 2012, and 2013, this paper will consider how the site's material culture assemblage affects its (re)interpretation and, in turn, what Surtshellir's archaeological record suggests about Norse mythology, ritual practice, and the roles of Norse elites in early Icelandic society. I will focus, in particular, on evidence gained from pXRF analyses about the movement of objects into, and within, the cave as proxies for the social status of those who gathered there and as indicators of how far they traveled and how often they gathered deep within the cave's dark zone. Turning to the places of origin, colors, and symbolism of the objects left within the cave I will consider what was chosen and what was avoided when objects were selected for use and sequestration inside this subterranean Viking Age ritual site.

[50]*Chair*

Smith, Kevin [50] see Marengère, Véronique

Smith, Laura [56] see Harle, Michaelyn

Smith, Maria (Syracuse University) and Alex Garcia-Putnam (University of Wyoming)**[239]***Weavers of "Pro and Profit" Weaving an Imperial City from a Rural Obraje*

During the early Colonial period in Peru Antonio de Oré, a native of the Canary Islands, moved to Peru in hopes of finding fame and fortune. In the 1570s Oré established the obraje (textile mill) de San Marcos de Chincheros (AD C. 1570-C.1823) outside of Huamanga (Ayacucho). At the obraje the mainly indigenous workforce was forced to produce large quantities of textiles for little compensation. Through his exploitative business practices Oré was able to make substantial financial contributions to the growing city of Huamanga, through which he gained a reputation as a man "of pro and profit" (Salas 1979). Pro, because of his charitable contributions to the foundation and support of Catholic convents and churches in the city; profit, because of the wealth he amassed through his unacknowledged exploitation of indigenous communities, wildlife, and natural resources. In 2019 excavations were undertaken at the obraje de San Marcos de Chincheros. Through the preliminary analysis of artifacts from the Obraje's workshops, dormitories, and cemetery, this paper examines the ways in which rural indigenous laborers, wildlife, and natural resources contributed to the growth of urban colonial communities

Smith, Maria [119] see Garcia-Putnam, Alex

Smith, Mark and Susan Malin-Boyce (USACE)**[132]***The Iraq Mass Graves Project*

Between 2004 and 2007, under the Direction of Dr. Michael "Sonny" Trimble the Mandatory Center of Expertise for the Curation and Management of Archaeological Collections (MCX CMAC) directed the systematic excavation, documentation, forensic analysis and reporting of multiple mass graves in Iraq. The work was undertaken at the request of the U.S. Department of Justice, Regime Crimes Liaison Office, to provide evidence to be used in the prosecution of the high ranking members of the former Iraqi regime. Dr. Trimble testified to the Iraqi High Tribunal in the trial of Saddam Hussein and six co-defendants for their responsibility for the Al-Anfal campaigns carried out against the Kurdish people in the late 1980s. He subsequently oversaw the repatriation of the exhumed victims to their homeland. The Iraq efforts built on many years of forensic experience previously gained by the MCX CMAC under Dr. Trimble.

Smith, Mark [132] see Brannan, Stefan

Smith, Michael (Arizona State University), Qitian Hu (University of Chicago), Timothy Dennehy (Arizona State University), Angela Huster (Arizona State University) and Luis Bettencourt (University of Chicago)**[26]***Spatial Clustering, Wealth, and Neighborhoods at Teotihuacan: A Complexity Approach*

We reconstruct the neighborhood organization of the ancient city of Teotihuacan by examining spatial clustering of residential architecture through a variety of methods. These include several spatial clustering algorithms (k-means, DBSCAN, mean shift), Thiessen polygons centered on civic features (3-temple groups and large plazas), and neighborhood boundaries as proposed by archaeologists. We explore alternative configurations for large- and small-neighborhood models. We find differences between inner neighborhoods (i.e., those closer to the Avenue of the Dead) that were likely based on civic features, and outer neighborhoods that lacked such features. These distinctions probably have both a chronological and functional origin. Based on data compiled by the Teotihuacan Mapping Project, we calculate the wealth/status distribution of each neighborhood and summarize neighborhood wealth inequality using the Gini index. The spatial distribution of these data illuminates the level of clustering of wealthy and poor neighborhoods. We also compare each neighborhood's wealth/status profile with that of the entire city. Our study contributes to the development of a framework for examining the local heterogeneity of a complex system (i.e., the city) across differing spatial scales.

Smith, Michael (Arizona State University)**[102]***Discussant*

Smith, Michael [26] see Ortman, Scott

Smith, Morgan (University of Tennessee, Chattanooga), Shawn Joy (Archaeological Research Cooperative) and Andrew Van Slyke (University of West Florida)**[18]***Clint's Scallop Hole (8JE1796): A Newly Discovered Prehistoric Quarried Landscape in Apalachee Bay, Florida*

In 2017, a newly discovered pre-contact archaeological site in Apalachee Bay, Florida, was reported to the authors by the Florida Fish and Wildlife Conservation Commission. Subsequent studies have found that the site is actually part of a much larger submerged landscape inundated ~5,000 years ago. In 2019, archaeologists with the Florida Submerged Prehistoric Landscapes Archaeological Survey and Heritage Project (SPLASH) conducted an initial survey of the site with undergraduate and graduate students from Florida State University, Texas A&M University, and the Universidad de la República in Uruguay. Our results found a series of pre-contact sites in 3–6 m of saltwater ~10 km offshore. This presentation discusses geophysical and archaeological data obtained from the site and surrounding area over the past two years. This paper also presents the results of lithic analyses at the site, which demonstrate that Clint's Scallop Hole represents an inundated bedrock quarry of Suwannee-type chert. A lack of formal tools and the extensive amounts of debitage indicate that this area served as an important lithic resource to prehistoric groups, who reduced the bedrock chert material for transport.

Smith, Morgan [238] see de Smet, Timothy

Smith, Morgan [147] see Newell, Zachary

Smith, Rachel (University of Oxford)**[64]**

The Overview Effect: Outer Space Perspectives of the Archaeological Landscape, a Case of Coastal Erosion, Quinhagak, Alaska

Space science and archaeology specialize in vertically opposite realms, yet contain the surprising potential for overlap. The theoretical nuances space science can lend to archaeology are invaluable for how archaeologists might approach representing and analyzing the past. Experiences such as the Overview Effect have enabled a shift in previously Earth-bound perspectives of humanity's place, not only in the cosmos but also within planet Earth. The use of satellites and remote sensing is not new in archaeology. However, archaeological work has yet to focus on a from space, overview perspective of past landscapes. Digital technologies, including GIS, 3D modeling, and various platforms enable for recreation of the overview effect for particular archaeological areas of interest. This research utilizes space science perspectives to re-create an overview effect visualization of Quinhagak, Alaska. Quinhagak, a region increasingly battered by coastal erosion due to the effects of climate change, is home to a rich cultural history. Proxy data is used to re-create the landscape from the perspective of space to enable a comprehensive understanding of the archaeological landscape of Quinhagak. It is the goal of this research to showcase the importance of the overview perspective in an archaeological context for archaeological analysis and cultural education.

Smith, Ryan (University of Pittsburgh)**[224]**

Now You See 'Em, Now You Don't: A Comparative Approach to Understanding the Realities of Inka Imperialism in the Eastern Andes of Southern Peru

Recognizing when, where, and how the Inka exercised power over local populations is crucial for understanding one of the world's largest and most powerful prehistoric empires. Yet so too must we seek to explain those circumstances where the exercise of Inka power and control was weak or altogether absent. Recognizing that Inka imperialism was multifaceted, this research offers a comparative approach to Inka imperial realities in the eastern Andean piedmont of southern Peru. Here, results from full-coverage pedestrian survey, intensive site mapping, and systematic surface collections in two separate yet neighboring valley systems of the Carabaya province are used to reconstruct demographics, land use, settlement patterns, and socio-political divisions along an important transitional border between the Andean altiplano and the eastern slopes. In particular, a comparison of pre-Inka and post-conquest patterns is used to assess regional continuities and changes, highlighting interesting discrepancies in the overall impact of conquest and administration. Ultimately, the mixed realities of imperialism in these separate valleys offers interesting clues to Inka administrative strategies at the eastern edge of the empire as well as the role local communities had in influencing the final measure of imperial power.

Smyth, Heather (Arizona State University) and Christopher Carr (Arizona State University)**[99]**

Scioto Hopewell Ideas about Multiple Soul-Like Essences in Humans: Mortuary Expressions in View of Postcolonial Woodland and Plains Soul Concepts

Scioto Hopewell conceptions of soul-like essences in humans are evident in the systematic placements of grave goods of particular kinds at particular bodily locations of inhumations, and with insights from comparative information on historic Woodland and Plains Native Americans. Analysis of 284 burials from 11 Scioto Hopewell cemeteries indicates a recognition of one "free" journeying soul and multiple "body" souls; their bodily residences, locations of exit upon death, and likely directions taken; differing functions of different souls; and different "medicines" placed with different souls. Whether souls of individuals of different ages, sexes, and communities were thought to vary is explored.

Snider, Joseph (Ohio Valley Archaeology Inc.) and Jarrod Burks (Ohio Valley Archaeology Inc.)**[176]**

Recovering Data from the Trace Rockshelter in Jackson County, Ohio: A Successfully Litigated NAGPRA Case

In late 2012 the Trace Rockshelter site in Jackson County, Ohio, was looted by three individuals. They later sold what they had found to a fourth individual, including the skeletal remains from eight burials and many artifacts recovered from a dense midden. DNA evidence was used to confirm the human remains were Native American and two of the excavators and the buyer of the artifacts pleaded guilty in U.S. District Court under NAGPRA. Ultimately, the remains and objects were repatriated for reburial. In this poster we present details related to the many hundreds of artifacts related to this case. Projectile points from across nearly every time period were recovered, as well as a large Late Archaic/Early Woodland period ceramic assemblage and bone tools, two of which were radiocarbon dated to the Late Archaic and Middle Woodland periods. Though this robust artifact assemblage comes from an unfortunate situation, the data derived from it compares well with other rockshelter excavation results in southern Ohio.

Snitker, Grant (University of Georgia), Sean Bergin (Center for Social Dynamics & Complexity, Arizona S) and Pete Cadena (U.S. Forest Service, Okanogan-Wenatchee National For)**[77]**

R-Based Solutions for Synthesizing Archaeological Survey Data to Assess Changing Land-Use Patterns in the Okanogan-Wenatchee National Forest, WA

Archaeological research has benefited from decades of site-specific projects, regional comparisons, and theory building from case studies. However, recent research themes concerning the emergence of complex social-ecological systems, such as long-term land-use legacies and the emergence of the Anthropocene, require a new approach to archaeological data. Large-scale syntheses of archaeological, paleoenvironmental, and geographical information provide an effective way forward in order to address new research themes. In more concise terms—'big questions' require 'big data' to help answer them. The archaeological information collected by the USFS is one such 'big dataset' and represents an incredible investment in time, resources, and expertise. This poster presents the initial results of a pilot study to develop an R-based workflow to digitize, extract, and synthesize archaeological

information across the entirety of the Cle Elum Ranger District, within Central Washington's Okanogan-Wenatchee National Forest. Our results indicate that synthesizing district-level archaeological data reveals patterns of land-use that were otherwise not recognizable. This work has the potential to not only strengthen this dataset's role in forest-wide cultural resource management, but also reposition cultural resources as a valuable tool in creating knowledge and policy with direct influences on the health of human-environmental relationships in the future.

Snitker, Grant (University of Georgia)

[117]

Moderator

Snow, Meradeth (University of Montana) and Michael Searcy (Brigham Young University)

[173]

Migrating Genes: Using aDNA and Archaeological Data to Explain Migration in the Casas Grandes Region of Northern Mexico
Migration as an archaeological topic has addressed huge distances, such as the colonization of the Americas, as well as smaller regions, such as the peopling of specific sites. The use of genetics as a medium to enhance our understanding of population movement can be an asset. There are potential pitfalls, however, such as the misrepresentation of DNA ranging across the landscape without human vectors or motivations. Genomic data must be interpreted through the lens of all available data from the site and surrounding region in order to understand how the data fit into the potential for human migration. These ideas will be discussed with mitogenome data accumulated from the site of Paquimé in Casas Grandes, Mexico, which has long been tied to hypotheses of migration from the south and north. How such migrations could be identified genetically and fit into the larger understanding of the site will be discussed, particularly in respect to the cultural transformation and florescence that marks the transition from the Viejo to Medio periods. While mitogenome data points to in situ population growth, there is genetic evidence that aligns with the archaeological record that individuals were migrating into the region from both the north and south.

Snow, Meradeth [173] see Plattner, Paige

Snow, Meradeth [244] see Rizzolo, Alexis

Snow, Meradeth [169] see Summers-Wilson, Rachel

Sobel, Elizabeth [213] see Worman, F. Scott

Soe, Naing [28] see Macrae, Scott

Soe, Nyein Chan [28] see Macrae, Scott

Soficaru, Andrei [169] see Wright, Sterling

Soler-Arechalde, Ana (UNAM), Laura Beramendi-Orosco (Universidad Nacional Autónoma de México) and Galia González-Hernández (Universidad Nacional Autónoma de México)

[10]

Archaeomagnetic Studies in Xalla: Contributions to the Chronology of Teotihuacan

The results of three sampling stages carried out in Xalla, a neighborhood with the Teotihuacan government offices under the direction of Dr. Manzanilla in 2001, 2003, and 2012 are presented. A total of 28 archaeomagnetic samples were taken and processed in the Laboratory of Paleomagnetism of the UNAM. Secular variation curves of the geomagnetic field for that area of the country were constructed with data from Wolfman (1990), Hueda et al. (2004), and Soler et al. (2006), Hernandez-Avila (2005), Romero (2008) and Terán (2013). The new data used in the curves have been corroborated by radiocarbon dating. Bayesian statistics were employed for archaeomagnetic dating. Ten dates have been obtained, one Miccaotli, one Tlalmimilolpa, and eight Xolalpan, two of which correspond to the great fire that caused the abandonment of the city. The data is compared with the chronology proposed by Beramendi et al. (2009) with data from Teopanaczo and other chronological series from the central neighborhoods of Teotihuacan.

Soler-Arechalde, Ana [10] see Beramendi-Orosco, Laura

Solis, Kristina (University of Texas, San Antonio)

[179]

An Analysis of Hunter-Gatherer Mobility and Territoriality in the Late Archaic Texas Coastal Plain Using Strontium Radiogenic Isotopes

The development of territoriality in human groups is a significant cultural process tied to concepts of private ownership and is often the foundation for the development of land tenure, trade networks, socioeconomic inequalities, and warfare. Hunter-gatherer mortuary sites found in the Texas Coastal Plain (TCP) have been assumed to be indicators of territoriality; however, there are few direct archaeological evaluations of this hypothesis. During the Late Archaic (4000–1200 BP), there is a marked increase in the size and number of mortuary sites that correlates with a peak in population density. This increase in population density would have had a large effect on social dynamics in the TCP, including the possible formation of territoriality. This project will utilize strontium radiogenic isotopes ($^{87}\text{Sr}/^{86}\text{Sr}$) to explore mobility and territoriality of Late Archaic hunter-gatherers in the TCP focusing on the

mortuary site of Loma Sandia (41LK28) in Live Oak County Texas. 87Sr/86Sr of 54 individuals from the site will be compared to each other and to bioavailable 87Sr/86Sr from several locations throughout the TCP. By comparing individuals to bioavailable 87Sr/86Sr from surrounding landscapes, a better understanding of mobility patterns will be developed and also allow for the interpretation of territorial behavior.

[179]

Chair

Solís, Reyna [10] see Melgar, Emiliano

Solometo, Julie (James Madison University), Wesley Bernardini (University of Redlands) and Gregson Schachner (University of California, Los Angeles)

[98]

Western Pueblo Social Organization Revisited

Steve Plog's undergraduate senior seminar "Western Pueblo Social Organization" launched the careers of a number of archaeologists, including our own. This class introduced students to many of the themes that he has pursued over the course of his career, including the co-evolution of social organization, economy, and religion; the ownership and transmission of ritual knowledge by social groups; and the construction and maintenance of village solidarity. In this paper, we discuss how our current work conducted in collaboration with the Hopi Cultural Preservation Office explores these themes. This project has generated significant new insights into the time depth and scale of settlement on the Hopi Mesas, and especially the complexity of the formation of post-AD 1200 villages during an era of extensive regional migrations. For this paper, we examine the latter process through the lens of newly gathered architectural, demographic, and rock art data.

Somerville, Andrew (Iowa State University)

[153]

Discussant

Somerville, Andrew (Iowa State University), Isabel Casar (Universidad Nacional Autónoma de México), Daniel Dalmas (Iowa State University) and Pedro Morales (Universidad Nacional Autónoma de México)

[233]

Investigating the Pleistocene-Holocene Transition in the Tehuacan Valley of Mexico: New Dates and Isotopic Data

The dry caves and floodplain archaeological sites of the Tehuacan Valley in Puebla, Mexico, excavated by Richard S. MacNeish and his team in the 1960s, contained some of the earliest macrobotanical evidence for domesticated New World plants, including maize, avocados and chili peppers. While many studies have focused on the levels associated with these domesticated cultigens, less attention has been paid to the earliest deposits of the caves, which according to the excavators, spanned the Pleistocene-Holocene boundary. Here we present new AMS radiocarbon dates from the lowest levels of Coxcatlan cave (Ajuereado and Riego Phases) and stable isotope data from faunal bones (N=200) from nine site locations within the valley to document the timing of human occupation and to reconstruct the ecological contexts in which the early inhabitants lived. The AMS dates give us a new early date for the cultural sequence in Tehuacan and the stable isotope results allow us to reconstruct environmental changes over time. These data increase our ability to model human adaptations to the post-Pleistocene environments in Mexico and help us understand how such adaptations may have led to increases in sedentary lifeways and ultimately to the development of farming communities.

[233]

Chair

Somerville, Andrew [133] see Forest, Marion

Somerville, Andrew [78] see Waterman, Anna

Sommer, Christian [11] see Bader, Gregor

Son, Pham Thanh [17] see Marwick, Ben

Sonderman, Elanor

[172]

Are We Adequately Training the Next Generation? Ethics in Curation Education

Dilemmas of law and ethics in archaeology and archaeological curation are interconnected and codependent. In a system where explicit laws and regulations are largely lacking for curation and collections management, it becomes more difficult to require people to care about those things. The skill sets required for collections management and curation are, unfortunately, usually considered less important than the skill sets required for archaeological analysis or fieldwork. Thus, university collections are sometimes managed by archaeologists with no curation training, and no ability to teach those skills to students. We must also consider that an archaeologist who is only partly trained, will still have those skill gaps whether they are based in a university, a private museum, or a federal/other government position. One of the major ethical dilemmas facing modern archaeology, particularly curatorial practice, is the severe lack of educational opportunities, especially at the graduate level, for curation and collections management. This paper presents research conducted as part of my dissertation, with recent updates, quantifying how widespread this issue is. Until universities adequately train the next generation of archaeologists, museum professionals, and academics, we will not be able to move the discipline forward.

Song, Jixiang [35] see Sun, Yufeng
 Song, Jixiang [36] see Wei, Tianxu

Sorrell, Daniel [255] see McNamee, Calla

Sorresso, Dominique (University of Florida), C. Trevor Duke (University of Florida), Gifford Waters (Florida Museum of Natural History) and Charles Cobb (Florida Museum of Natural History)

[123]

From Missions to Markets: Petrographic Analysis of Indigenous Ceramic Manufacture and Spanish Colonial Influence on San Marcos Pottery

Following the collapse of the Spanish mission system of Florida in the early eighteenth century, many Native mission populations were relocated into "refugee" mission settlements on the outskirts of the colonial city of St. Augustine. Archaeological evidence suggests that while traditional ceramic practices were maintained to some degree, all local Native groups also began producing San Marcos pottery, a type traditionally made only by a few coastal indigenous groups. During this time period approximately 90% of all ceramics in colonial households in St. Augustine are Native American, with the vast majority being San Marcos. Possible explanations for these unusually high quantities of Native ceramics include the presence of Native women in colonial households, either as wives or domestic helpers, or the mass production of San Marcos pottery for public markets based on a Spanish preference for the type. This study investigates potential differences between San Marcos pottery from the eighteenth-century colonial households to San Marcos pottery from eighteenth-century mission sites using petrographic analysis. These data are used to evaluate the production of San Marcos as a potential market ware and identify variation in San Marcos pottery between different cultural groups in the missions.

Soza, Danielle (University of Arizona)

[23]

The Archaic U.S. Southwest: Reconsidering the Archaeological Narrative

The Archaic period in North America has received mixed attention depending on the region. In the U.S. Southwest, attention to the Archaic period is most often focused on its end, marked by increased sedentism and reliance on agricultural subsistence practices. Although archaeologists studying the Archaic in the U.S. Southwest understand and acknowledge the cultural diversity during the Archaic in the region, discussions often orient this period to the advent of agriculture. In other words, Archaic research in the Southwest primarily remains a time period that is used to understand the beginnings of the large-scale agricultural societies that follow. Few scholars have attempted to look beyond subsistence based research and cultigen studies to consider the social implications of movement and place. This paper looks at the Archaic period in the U.S. Southwest as a culturally dynamic period of innovation and complex social interactions using a landscape approach. Although often lacking archaeological materials, especially in the Early and Middle Archaic, when we apply a landscape approach to discussing concepts of place and memory we can tap into the complex interactions these early mobile communities had with each other and their cultural landscapes.

Soza, Danielle [23] see Zedeño, María Nieves

Spain, Emman (Muscogee Creek Nation)

[113]

Discussant

Sparks, Shane [252] see Bryne, Stephen

Sparrow, Tom [107] see Gaffney, Chris

Spaulding, Britta (University at Buffalo)

[159]

The Girl (from the Marsh Croft) I Left Behind? Gender Archaeology and Industrialization in Early Modern Sweden

While "but where were the women?" was the very base question for the establishment of the study of gender in archaeology, it is not actually a simple question. While knowledge about women's roles and lives in Western societies is not unknown in archaeological and historical data, it still does not often feature in the "big questions" or in the scales of study beyond the household, even in the archaeology of early modern or modern periods. I discuss how we can look at and look for women's roles in industrializing Sweden. Even up to the twentieth century, Sweden was mainly an agrarian society, even during the post-medieval, militarizing, empire-building, nation-state in the early modern period. However, this society had occupational pluralism and inherent creativity within that. During the wars with Denmark, and the battle for control of the Baltic Sea, which necessitated increasing the acquisition of natural resources, and required different kinds of production from the populace and burgeoning early factories, women were there: but what were they doing? This is understudied territory and archaeology has the potential to divulge more understanding about "the other half" of society in times of long economic and technological change and upheaval.

Speakman, Robert [231] see Napora, Katharine

Speller, Camilla [129] see Fladeboe, Randee

Spenard, Jon (Cal State University San Marcos)

[137]

A Long-Overdue Return to the Cold River: Archaeology of the Rio Frio Caves, Cayo District, Belize

The Rio Frio caves in western Belize have long been recognized as significant landmarks in the emergence of contemporary Maya cave archaeology theory and practice. Yet, given their place in the history of the discipline they remain poorly understood and understudied. In 2018, they became a primary focus of the Rio Frio Regional Archaeological Project (RiFRAP), the first multiyear project dedicated to their archaeological investigation. Among the goals of the RiFRAP are (1) establishing individual cave and regional chronologies, (2) determining who was using the caves, and (3) why, (4) mapping the caverns to contemporary archaeological standards, (5) employment of digital recordation in those efforts, and (6) reconnaissance for all known and unrecorded cave sites in the study area. This presentation reviews the history of research in the area and discusses the results of our first two field seasons. In short, all known sites were used during the Late to Terminal Classic periods (AD 700–900/1000) by Maya people strongly affiliated with the Belize Valley. As well, our reconnaissance efforts resulted in the rediscovery of a primary center unknown to archaeology, the people from which were likely who were using the caverns.

Spence Morrow, Giles (University of Toronto)

[32]

Discussant

Spencer, Charles [17] see Covey, R. Alan

Spencer, Kaylee [164] see Werness-Rude, Maline

Spicola, Erin [254] see Kassabaum, Megan

Spieß, Arthur [9] see Kelley, Alice

Spitzer, Megan [129] see Wellman, Hannah

Spivak, Deborah [243] see Berry, Nora

Spivey, S. Margaret [166] see Mueller, Natalie

Splitstoser, Jeffrey (George Washington University) and Jon Clindaniel (University of Chicago)

[164]

Color Conventions in Wari and Inka Khipus

The colors of pre-conquest Andean khipus have long been thought to have played an important role in the encoding of information. Spanish chronicler testimony, for example, tells us that Inka khipu colors had specific, conventionalized meanings. However, pre-conquest khipu color signs remain undeciphered and poorly understood. In this presentation, we approach the problem diachronically, exploring how color signs were used in both Middle Horizon and Late Horizon khipus. We then compare and contrast the colors and color “schemes” found in these khipus from different periods and interpret why similarities and differences in semiotic strategies existed over time. Finally, we discuss how our diachronic findings can be used as a starting point for beginning to decipher the meanings of khipu color signs.

Sponheimer, Mathew [189] see Joyce, Arthur

Sportman, Sarah (AHS Inc.; University of Connecticut) and Scott Brady (Office of State Archaeology, Connecticut)

[13]

“Remote from the Other English Plantations”: Reflections on Current Seventeenth-Century Research in Connecticut

Recently, work by several Connecticut archaeologists has focused on the seventeenth century with great success. Extensive investigations at sites such as Lt. John Hollister Site, the Webb-Deane-Stevens Site, and a number of Pequot battlefield and domestic sites, are beginning to shed new light on the tumultuous early period of the Connecticut Colony. Many of these sites contain incredibly well-preserved archaeological deposits with the potential to expand our understanding of the economic relationships, social milieu, military struggles, and environment of seventeenth-century Connecticut, and they provide a rich source of information about the daily lives of the Native American and English people living there. Documentary research demonstrates that in the microcosm of early Connecticut, many of the people associated with these sites were tied together through their economic and social relationships; they traded, intermarried, fought, and worked together, although not always in harmony. This paper reflects

on the developing wealth of new information and calls for a holistic approach to ongoing research. In the spirit of the late Connecticut State Archaeologist Brian Jones, we should work together, integrating this data to tell the rich stories of early Connecticut and find innovative ways to share those stories with the public.

Sportman, Sarah [13] see Leslie, David

Spring, Ryan (Historic Preservation Dept.)

[116]

Discussant

Springer, Corinne (Natural History Museum of Utah) and Shannon Boomgarden (Natural History Museum of Utah)

[245]

Archaeological Investigations in Range Creek Canyon: Emery and Carbon Counties, Utah

Archaeological investigations in Range Creek Canyon, located in east central Utah, have led to the identification of approximately 500 prehistoric sites. The vast majority of sites that can be culturally affiliated are Fremont, semi-sedentary horticulturalists that occupied the region AD 300–1175. Broadly speaking, sites range from relatively long-term habitation sites, short-term use artifact scatters, rock art and granaries. Examples of each site type can be found from the valley floor to the towering cliff tops. Some site types are found clustered, particularly multi-structural sites thought to be small village sites. Research at the Range Creek Field Station operated by the Natural History Museum of Utah at the University of Utah has been focused on experimental archaeology in an attempt to understand the costs and benefits of subsistence strategies employed by the Fremont as a means to understand the observed patterning of these sites. These experiments include growing plots of heritage maize, monitoring water levels in the creek and harvesting wild resources. Data collected in the course of these experiments may be applied to questions of settlement patterning in the canyon.

St. Amand, Frankie (University of Maine Climate Change Institute)

[59]

Comparing El Nino Proxies from the Archaeological Record

El Nino Southern Oscillation (ENSO) is a coupled atmospheric and oceanic climate system with global impacts at sub-decadal timescales relevant to humans. The core El Nino (EN) warming impact area is the hyperarid North Coast of Peru. Here common high-resolution proxies are largely absent, but the archaeological record provides evidence of past climate change and enables reconstruction of ENSO over time. Tracking EN changes since the terminal Pleistocene elucidates human behavior and adaptation to climatic occurrences from Pleistocene through modern ENSO events. This study seeks to use isotopic analyses of mollusks harvested during 2019 to improve understanding of a variety of species as paleoceanographic proxies and to address conflicting evidence of regional EN frequency and intensity since the terminal Pleistocene inferred from local datasets. The question to be addressed is: Are differing interpretations due to changes in ENSO manifestations south of 10–12° S (a known climatic transition zone), or due to misinterpretations of local paleoenvironmental datasets used to infer regional EN events? As species of bivalves react differently to environmental conditions (e.g. temperature-dependent fractionation of stable isotopes) analyses may not produce uniform results, affecting interpretations of past events. This work with modern mollusks can help refine interpretations of archaeological specimens.

Stabenow, Ashley

[202]

Lines in the Sand: Investigation of an Enclosing Feature at Pueblo Colorado, New Mexico

Boundaries divide spaces and define social interactions between people in a myriad of ways. Finding new examples of boundary creation in the archaeological record informs the larger conversation regarding the construction and maintenance of physical boundaries as a strategy for navigating and informing complex relationships between people. In the Salinas Province in central New Mexico, recent lidar survey revealed the presence of an earthen ditch-like feature, 2 km in diameter, encircling and enclosing a late precontact Pueblo community. Other Pueblo sites within this region have identified defensive walls encircling the main occupation area, but as of yet no other ditch-like features similar to the enclosing feature at Pueblo Colorado have been documented in the archaeological record. This feature was explored utilizing a combination of surficial mapping techniques and targeted test excavations to reveal new data regarding feature morphology and construction, as well as decommissioning procedures. These lines of evidence, taken together, shed light on the potential function of the enclosing feature.

Stacey, Rebecca (The British Museum)

[258]

Gum Paint Binders from Precolumbian Cave Art at Mona Island

Research on gum-derived paint binding media has largely focused on characterization of media from Western art materials and Old World gum sources, for example, *Acacia* spp. The compositions of exudates from native Caribbean sources have not received the same attention. This paper presents the results of recent research at the British Museum on binding media from precolumbian cave art on the island of Mona in the northern Caribbean. The results of GC/MS analysis of the paints will be discussed in terms of the challenges of achieving secure botanical identifications based on sugar compositions, with reference to gum binding media studies we have undertaken on other material. The significance of the gum binding media to the interpretation of the cave art at Mona will be considered as well as the prospects for future study.

Stadler, Harald [188] see Gray, D. Ryan

Stafford, Thomas [19] see Sun, Nan

Stafford, Thomas, Jr. (Stafford Research Inc.), Ernest Lundelius (University of Texas, Austin) and Michael Waters (Texas A&M University)

[19]

Geochronology of Hall's Cave, Texas

Hall's Cave exemplifies how rapidly chronological and paleoecological sciences have advanced in 30 years since excavations began. In 1986, both aDNA and accelerator mass spectrometry (AMS) ^{14}C dating were in their infancy. The cave's first ^{14}C measurements used conventional (β -decay) techniques requiring > 100 g of rodent bones and tens of grams of sediment. Starting in 1990, AMS ^{14}C dates have been made on single bones and teeth weighing < 100 mg, 1 cm cubes of sediment, and any purified sample type yielding 100 μg of graphitized carbon. These field and laboratory advances have enabled Hall's Cave's geochronology to be measured at unprecedented accuracy and stratigraphic precision, thus providing never-before achieved temporal control for paleontological, aDNA, biogeochemical, and archaeological studies. The cave strata span Modern, ongoing deposition of guano, vegetation, and animal carcasses to at least 20.6–20.0 ka cal BP at the base (3.7 m) of known deposits. A sedimentation rate of 1cm/32 yr. between 20–13 ka cal BP decreased to 1 cm/87 yr. afterward. Megafauna extinctions, including Equus, Smilodon, B. antiquus, and Platygonus, occurred by ca. 11,200 RC yr. BP, ~300 calendar years before the Younger Dryas onset at 10,900 RC yr. BP.

[19]

Chair

Stafford, Thomas, Jr. [66] see Battillo, Jenna

Stafford, Thomas, Jr. [19] see Waters, Michael

Stagg, Sarah (University of Wyoming) and Jason Toohey (University of Wyoming)

[243]

Domestic Space and Residential Organization at the Early Intermediate Period Cajamarca Site of Callacpuma, Peru.

Callacpuma is a multicomponent archaeological site in the Cajamarca Basin of the northern highlands of Peru. The site was occupied for approximately 2500 years, throughout the Formative and Cajamarca Periods (1000 BC–AD 1532). Our research focuses on Platform 2, the largest of nine human-made platform mounds located on the summit of the site. Platform 2 was occupied during the Initial and Early Cajamarca periods (100BC– AD 600) and is covered with domestic architecture. Initial excavations as well as mapping and surface collections are used to examine residential organization through analysis of architectural patterns of rooms, plazas, and corridors located on Platform 2. We consider room size and location as well as quality of construction and associated features and artifacts (found in both surface collection and test excavations) to expand our understanding of Initial and Early Cajamarca domestic architecture and spatial organization.

Stainton, Adrienne (Texas State University), Ashley McKeown (Texas State University) and Nicholas Herrmann (Texas State University)

[215]

Analysis of Cultural Retention in an Eighteenth-Century Enslaved African Cemetery in the Dutch Caribbean

The island of Sint Eustatius, once the world's wealthiest free trade port, played an important role during exploitation and globalization of the New World. This research project addresses the retention and/or loss of traditional cultural practices of enslaved Africans in the wake of European presence and influence by assessing burial practices at an eighteenth-century cemetery used by enslaved Africans. Artifacts and mortuary data from excavations of the cemetery between 2012 and 2019 were analyzed. Spatial attributes of the burials were documented using photogrammetry from the 2019 excavations. Comparative samples used to assess cultural retention are from roughly contemporaneous West African and/or African burial grounds in the New World. The relevant frequency of mortuary and funerary attributes at the cemeteries as well as results from the Fisher Exact test of independence between sites suggest both loss and retention of African cultural mortuary practices compared to other enslaved and/or freed African burial grounds.

Staller, John (Field Museum)

[197]

Incahuasi de Caranqui, the Palace Complex of Atahualpa, the Last Inca Emperor, Imbabura Province, Ecuador

The "house of the Inca" or Incahuasi de Caranqui in Imbabura Province is located in the indigenous town of Caranqui south of the provincial capital of Ibarra. Incahuasi de Caranqui was a palace estate constructed by Huayna Capac in the context of expansion into northernmost Ecuador and birthplace of his son Atahualpa, the last Inca emperor. Spanish chroniclers state it was the birthplace of Princesa Pacha, the favorite wife of the Inca emperor and mother of Atahualpa. Incahuasi is situated directly beside the Inca highway or Camino Real at the foot of the Imbabura volcano. It was buried several times by landslides related to earthquakes and volcanic eruptions. Archaeological research of a rectangular cut stone pool uncovered in the course of field research and fed by stone canals that maintained a constant depth in the pool. Lunar and solar reflections on the surface of the water were related to calculating different points in the annual cycle.

Stanish, Charles (University of South Florida)

[152]

Discussant

Stanish, Charles (University of South Florida)

[181]

Discussant

Staniuk, Robert (Christian-Albrechts-Universität zu Kiel)

[263]

Long-Term Cultural Change and Short-Term Cultural Choices: A Practice-Based Quantitative Analysis of Bronze Age Ceramics from a Multilayered Settlement in Kakucs-Turján (Hungary)

Early and Middle Bronze Age settlements in the Carpathian Basin (2300–1450 BC) are primarily characterized by the re-emergence of the tell building practice. This particular form of occupation, due to its similarity to the one practiced in the Middle East, has been used as an argument for considering such sites as central places controlling long-distance trade networks reaching from the Baltic Sea to the Mediterranean. However, such models are based on top-down perspectives of social formation implying that the Bronze Age saw the formation of the first states in continental Europe. In this paper it is argued that the archaeological record of these settlements actually provides evidence of how diachronic occupational shifts of subsequent generations can be linked to continuous, small scale changes of social practices. By focusing on such diachronic changes it is possible to investigate whether often implied large scale processes affected the everyday life of the communities. To that end, ceramic material from a multilayered settlement is used to answer questions regarding processes of long-term cultural change and short-term cultural choices. The provided historical trajectory serves as a counter-argument to traditional narratives by shifting the focus toward acknowledging the significance of small-scale processes.

Stanley, Harrison [63] see Zedaker, Dylan

Stanton, Travis (University of California Riverside), Traci Ardren (University of Miami), Nicolas Barth (University of California Riverside), Juan Carlos Fernandez-Diaz (NCALM) and José Osorio León (INAH)

[102]

People, Pixels, and Points per Square Meter: The Challenges of Using Lidar to Estimate Populations in the Northern Maya Lowlands

Despite the fact that lidar technology has revolutionized the way in which Maya archaeologists collect and interpret regional settlement data, many challenges remain. In regards to estimating regional populations the lack of good chronological data serves as a serious impediment for trusting population estimates. However, the fact that we can now see a large percentage of past settlement systems in the datasets we work with gives us new, and sometimes surprising, insights into the broader trends of population histories that we should not ignore due to our reservations concerning the lack of chronology. Further, in some cases we do have some chronological data from which to extrapolate. In this paper we discuss the challenges we have faced in attempting to estimate populations in a roughly 450 km² area of the northern Maya lowlands that includes the ancient cities of Chichen Itza, Coba, and Yaxuna as well as large swaths of rural areas.

Stanton, Travis [225] see Colman, Jeremy

Stanton, Travis [5] see Waite, Danielle

Stanyard, Zachary (University of Texas, Austin), Phoebe Fairbairn (University of Texas, San Antonio), Lauren Sullivan (University of Massachusetts, Boston) and Fred Valdez Jr. (University of Texas, Austin)

[53]

Ritual Assumptions and Practical Implications of Problematic Deposit NC-1 at the Site of Las Abejas, Belize

Ancient Maya problematic deposits have often been interpreted a priori as representing ritual activity. In many cases, these deposits have been analyzed as singular datums rather than a conglomerate of information confined to a small spatial extent. Rather than lean on ritual interpretations of what may have been occurring, we propose that insights into social and political economy can be ascertained by the careful analysis of these complex features. Las Abejas is a medium sized community located in the Three Rivers Region of Northwest Belize in the Rio Bravo Conservation area. Excavations in the North Courtyard of Las Abejas in the summer of 2019 revealed a deposit (PD NC-1) of roughly 5,300 ceramic sherds, several stone tools, greenstone, and other elite goods. This paper will discuss this new find and also provide a comparative analysis of previous interpretations of similar deposits in the region.

Stark, Barbara (Arizona State Univ)

[227]

Discussant

Stark, Miriam, Peter Grave (University of New England), Lisa Kealhofer (Santa Clara University), Piphal Heng (University of Hawai'i, Manoa) and Darith Ea (APSARA National Authority)

[168]

Large-Scale NAA Provenancing of Angkorian Khmer Stonewares, Cambodia

Ron Bishop has led archaeologists in NAA applications for more than 30 years and made important contributions to New World

studies of political economy. More recent applications of NAA in Southeast Asia have begun to rewrite our understandings of ninth- to fifteenth-century CE economic networks. From 2014–2017, our international collaboration involved a large-scale NAA geochemical provenancing study of stoneware ceramics from Angkorian production and consumption contexts. Khmer stonewares served both as ritual temple furnishings and household goods within the Angkorian Empire; these stonewares offer a unique opportunity to study the Angkorian economy. Unlike stoneware manufacture in neighboring regions, Khmer stoneware production was almost entirely for 'domestic' consumption, closely mapping the Khmer political footprint. Thai and Vietnamese, but not Khmer, stonewares are recovered from historic shipwrecks throughout the South China Sea and its environs. A long-term goal of the Khmer Stoneware Production and Exchange Project (KPX) is to articulate patterns of stoneware production, consumption, and distribution as proxies for internal dynamics of the Angkorian world. Here, we present and discuss some results from our ongoing work, including the compositional distinctiveness of stonewares from different kiln complexes and implications for understanding consumption patterning for the Middle Mekong River area of Cambodia.

Starkovich, Britt [162] see Wong, Gillian

Stasiek, Artur [213] see Meierhoff, James

Stasiek, Artur [160] see Porubcan, Paula

Stauffer, John (Washington University, St. Louis)

[47]

The Disintegration of Style and Memory: Mound 3 Assemblages at the Lake Jackson Site, Florida

At the 75th meeting of the Society of American Archaeology, Claudine Payne proposed that Lake Jackson's Mound 3 served as a repository for ritual heirlooms that could no longer be used in the manners their creators intended. This paper revives her hypothesis to examine the role of this archaeological context at the geographic and temporal periphery of the Braden Style horizon. As this symposium's participants agree that artworks in this style transform objects used for ritual into political resources, I entertain the notion that a loss of essential ancestral knowledge for their use is accompanied by risks associated with their misuse. Consequently, Mound 3's construction could be interpreted as a preventative measure that secured these potent heirlooms with the deceased individuals whose voices could no longer be heard by the living. From the author's perspective, Lake Jackson thus provides an important bookend in discussions about the communicative qualities of Native North American iconography.

Stauffer, John (Washington University, St. Louis)

[166]

Chair

Stauffer, John [166] see Heep, Nathan

Stauffer, John [166] see Mersmann, Joy

Steadman, David [27] see LeFebvre, Michelle

Steelman, Karen (Shumla Archaeological Research & Education Center)

[16]

New Rock Art Dates for the Lower Pecos Canyonlands

The Shumla Archaeological Chemistry Laboratory has obtained new radiocarbon dates for Pecos River, Bold Line Geometric, Red Linear, Red Monochrome, and historic period styles of rock art. Using two independent methods, we provide reliable age estimates. For direct dates on paintings, we employed plasma oxidation to extract organic binders in the paint layer followed by accelerator mass spectrometry. For minimum and maximum ages, we treated overlying and underneath accretion layers with acid to isolate calcium oxalate for combustion and C-14 measurement to determine when the mineral coatings formed. Radiocarbon results are calibrated using the OxCal computer program to produce calendar age ranges. Overlying accretion layers are younger and underlying accretion layers are older. This correctly ordered, chronological stratigraphy of the accretion and paint layers supports the validity of both dating methods. These new results provide context for the significant, but lesser studied pictographs within the region.

Steere, Benjamin (Western Carolina University)

[160]

Preserving the Nikwasi Mound: Archaeology, Controversy, and Tribal Sovereignty in the Cherokee Heartland of Western North Carolina

The Nikwasi Mound (31MA2) in Franklin, Macon County, North Carolina is paradoxically one of the best preserved but least understood mounds in the Cherokee heartland of western North Carolina. The mound was likely first constructed during the Mississippian period and later served as the platform for a historically documented townhouse marking the location of an important Cherokee "mother town." The mound itself was preserved in 1946, but the area surrounding it was filled, graded, and developed. In July 2019, ownership of the mound was transferred from the Town of Franklin to the Nikwasi Initiative, a non-profit organization with representatives from the Eastern Band of Cherokee Indians, local county and city governments, and a conservation organization. Heated debates about the preservation of the mound played out in news reports, town hall meetings, and social media, and in some cases, speculative or inaccurate claims about the archaeology of the mound were disseminated to the public. In this paper I summarize archaeological and historical information about Nikwasi and draw on theoretical insights from indigenous archaeology to

consider how the past and future preservation of the mound relates to broader issues of cultural heritage management and tribal sovereignty.

[160]

Chair

Steere, Benjamin (Western Carolina University)

[208]

Discussant

Steffen, Anastasia (Valles Caldera National Preserve), Nicholas Jarman (Valles Caldera National Preserve) and Stephanie Bergman (Valles Caldera National Preserve)

[9]

First Came the Fires: Valles Caldera Landscape Futures in a Changing Climate

In the last two decades, the Jemez Mountains in north-central New Mexico have experienced devastating wildfires due to the intersection of climate change and twentieth-century forest management practices. Over 60% of the Valles Caldera National Preserve (VCNP) has burned since 2011. Here, climate change impacts are not a question of if, or when, but what now and what next? This poster addresses "lessons learned" in the wake of historically-aberrant wildland fires and the resulting damage to an archaeological record rich in information about human uses and ecological contexts over the past nine millennia. Managing this landscape at risk requires preparing both for uncontrolled impacts from wildfire and for effects of landscape-scale restoration projects designed to proactively decrease the risk of catastrophic wildfire. We present the VCNP's due diligence in preparing for prioritization: applying National Park Service tools for vulnerability assessment and adaptation planning; evaluating costs and benefits of our forest restoration program; and respectfully considering the relative value of this archaeological record in the context of myriad and monumental challenges facing archaeologists at continental and global scales.

Stein, Kristoffer

[221]

The Past's Identity: A Study of Heritage Construction by Communities in Tucson through Archaeology

My research focuses on Tucson, Arizona, where for over a century extensive archaeological research has positioned the region as a prominent location for scholarship and heritage-based projects. Local government strives to build the region's heritage through community engagement and serves as a prime location for the focus of my research. I aim to explore how communities in Tucson construct narratives about the past. More specifically, I will interrogate how identity mediates concepts of heritage such as authenticity, continuity, and relevance. In what ways do communities engage with concepts of the past and how is this influenced by political, ethnic, and socio-economic identity? The methodology of the research is organized around a questionnaire survey administered to a neighborhood in proximity to archaeology sites and the Santa Cruz River where there is evidence for long-term human activity, and serves as the epicenter for heritage programs today. I will use quantitative measurements of association, and statistical significance to test the hypothesis that there is a measurable relationship between identity and constructions of the past. Moreover, I will argue that archaeologists have the responsibility to explore strategies where community diversity demands a diversity of approaches in order to facilitate productive engagement.

Steinbach, Erik [79] see Phillips, Bruce

Steinbrenner, Larry (Red Deer College), Carrie Dennett (Red Deer College) and Silvia Salgado (University of Costa Rica)

[168]

Perspectives on the GNCP and Ceramic Production in Greater Nicoya

The Greater Nicoya Ceramic Project (GNCP), a program that is in no small part synonymous with the work of Ron Bishop, has informed and guided archaeological research in Nicaragua and Costa Rica for more than 40 years. In this paper, we explore the role of this program in our own attempts to make sense of Greater Nicoya's celebrated (yet frequently misunderstood) ceramic traditions and their origins. Drawing particularly on two decades of research in the western littoral region of Lake Nicaragua, we will discuss how the GNCP has contributed to the identification of well-defined ceramic production zones in Pacific Nicaragua and outline how we plan to build on the project's work at the Palo Verde National Park in Costa Rica's Lower Tempisque Valley.

Steinman, Charles [50] see Bielenberg, Aliosha

Stelle, Lenville (Illinois State Archaeological Survey)

[60]

Chair

Stelson, Laura (Penn State University)

[64]

Predicting Prehistoric Routes for Long-Distance Trade across the Alaska Peninsula

This poster demonstrates the results of a multivariate network analysis performed in GIS that identifies potential preferred routes for long-distance travel and exchange across the Alaska Peninsula in prehistory, with the objective of identifying archaeological sites potentially positioned to facilitate the trade of localized raw materials from the Bristol Bay coast to communities along the Pacific

coast of the Alaska Peninsula, Kodiak Island, and Prince William Sound. Important variables in addressing this question include the direction and means of travel, topography, landscape cover, potential barriers to travel such as waterways and glaciers, seasonal conditions, and the load to be transported. Based on these factors, I identify least-cost paths of travel across the Peninsula under various conditions and rank their relative importance over time according to the chronology of nearby archaeological sites that were potential stopovers during travel. This method holds great potential for highlighting which corridors within this region require additional archaeological survey and identifying which sites functioned as interim or end destinations along the route. Ultimately, my goal with this project will be to assess the role that was played by now abandoned settlements within Katmai National Park in facilitating the transport of goods through this larger network.

Stemp, W. James (Keene State College) and Jaime Awe (Northern Arizona University)

[23]

Better Late Than Never: A Reassessment of the Preceramic in Western and Central Belize

Despite lagging behind the discoveries of Palaeoindian and Archaic people in Northern Belize, evidence for a preceramic presence in Western and Central Belize has increased significantly in the last two decades. Until recently, there was no known Palaeoindian lithic technology in these regions. However, the re-dating of Lowe Complex points indicates hunter-gatherers were there at least as early as the Late Palaeoindian (beginning ca. 10,500 BCE). There is ambiguous evidence for an Early Archaic human presence, but by the Late Archaic (3400–900 BCE) the use of plants, including early domesticates, is documented and stone tools for land clearance and/or early horticulture appear. Together, lithic technology, faunal remains, and plant pollen provide clues about subsistence practices and other resource use. The lithic raw materials from which tools were made offer insight into both local procurement strategies and the use of chert from outcrops in Northern Belize. The locations of recovery of these artifacts and ecofacts emphasize the importance of both caves/rockshelters and waterways in preceramic times. Archaeological evidence from Western and Central Belize is compared to that from other regions in Belize to better contextualize what we know about the preceramic overall.

Stempfle, Sabrina (Universität Hamburg), Jörg Linstädter (German Archaeological Institute) and Décio Muianga (Eduardo Mondlane University)

[250]

Bantu Arrival in Southern Mozambique: Ceramic Analysis as a Source of Information for Dating, Diversity, Technology Transfer, and Nutrition

In 2016, a research cooperation between the Eduardo Mondlane University and the German Archaeological Institute was started. Since then, this cooperation performed various surveys and geomagnetic prospection and developed a dedicated research project which this contribution introduces. The introduction of pottery to southern Africa is associated with the immigration of early farmers about 2,000 years ago, which are called the Bantu speakers. Recent research challenges this model, since distinct pottery was found in archaeological contexts of hunter-gatherer communities. Furthermore, the Bantu pottery in Mozambique, called Matola pottery, has been dated a few hundred years earlier, challenging the previous attribution to Early Farming Communities. The current research project aims to study the Matola pottery from old excavations as well as from current fieldwork in southern Mozambique using archeometric approaches to test the Bantu model and to investigate the beginning of pottery production in southern Africa regarding dating, the process and the diversity in raw material, techniques and use. The absolute ages will be reevaluated by radiocarbon dating, thermoluminescence dating and compound specific lipid dating. The diversity in raw material, technique and use within the classified pottery unit will be determined using polarized light microscopy, lipid analysis, X-ray fluorescence, and infrared spectroscopy.

Stenstrom, Sydney [148] see Baker, Caitlin

Stephan, Robert (University of Arizona)

[210]

Embodied Inequality: Skeletal Evidence of Colonization in Roman Britain

This case study on Roman Britain provides a reproducible methodology for analyzing the relationship between coercion and inequality in a variety of chronological and geographic contexts. In the recent past, scholars have investigated the dynamics of “Romanization” in Britain, focusing primarily on the manner of incorporation and the cultural results of this synthesis. This paper seeks to shift the conversation toward the socioeconomic effects of colonization by examining human stature and skeletal pathologies in order to assess the impact of Roman rule on populations in Britain. Driven in part by external factors such as diet, stress, and disease, human stature serves as a reliable proxy for the biological and economic well-being of a population. An increase in average stature within a closed population would be indicative of people eating more, working less, or living an overall healthier lifestyle. Statistical analysis of the distribution of skeletal heights during this transitional period suggests that Roman hegemony was accompanied by a significant increase in socioeconomic inequality. Comparing this skeletal evidence to the types and frequencies of pathologies within the same sample of skeletal remains suggests that Roman imperialism played a significant role in restructuring the daily lives of colonized populations through coercion.

Stephen, Jesse (DPAA) and Joshua Toney (Henry Jackson Foundation)

[188]

The Power of Partners: Accomplishments and Challenges of DPAA's Terrestrial Archaeology Partnership Program in 2019

The Defense POW/MIA Accounting Agency (DPAA)—not unlike many other entities—must strive to do more with less. As a federal government agency a key avenue for maximizing resources is to partner with other organizations that possess or engage in complementary interests, activities, and sensibilities. During 2019 the DPAA, through the Partnerships and Innovations Directorate,

grew its partnership efforts appreciably. This poster focuses on the Terrestrial Archaeology Program and presents information related to efforts undertaken during the course of the year. This includes a variety of metrics and insights into the scale of operations, the sum result(s) of all activities, and the partnership outlook for the future. Most importantly, we present this information alongside a selection of posters from our partners themselves. Overall, we aim to not only capture the successes and challenges of the year past but to also spark conversations and collaborations concerning how to best accomplish the mission of bringing home America's Missing in Action in the years to come.

[188]

Chair

Stephens Reed, Lori (Aztec Ruins National Monument), Aron Adams (Aztec Ruins National Monument) and Jeffery Wharton (Aztec Ruins National Monument)

[229]

A Closer Look at the Big Picture: Great House Community Dynamics at Aztec Ruins National Monument, Northwest New Mexico
Three Chacoan great houses (Aztec North, West, and East) comprise the focal point of the Ancestral Pueblo community at Aztec Ruins National Monument in the Animas Valley of northwestern New Mexico. The well-known occupational history of Aztec West and East, established through decades of tree-ring dating, includes over 4000 tree ring dates taken from structural timbers. Aztec North and the associated community of habitation sites contained within the monument are less well known, but integral to the establishment of the great house settlement. With completion of an archaeological inventory for all property within the monument boundary, the story of the Aztec great houses and the people who built these grand structures has expanded. Utilizing a number of analytical tools, such as ceramic mean dating, tree ring dating, architectural attributes, and GIS on the data resulting from inventory and past excavation projects, we propose a settlement history for the Aztec great houses and community. Our goal in this presentation is to offer a cohesive story of a great house community with its founding during the late AD 1000s, Chacoan heyday in the early AD 1100s, revitalization movement in the post-Chaco era, and final migration and depopulation by AD 1290.

Steponaitis, Vincas (UNC-Chapel Hill)

[96]

Discussant

Steponaitis, Vincas [202] see Boudreaux, Edmond

Sterling, Kathleen (Binghamton University)

[1]

Beyond Leaky Pipelines and Glass Ceilings: Equity Issues on the Academic Track

Achieving equity in academia is framed as a process of shattering a glass ceiling, letting everyone to climb as high as their abilities allow. Alternately, the leaky pipeline metaphor relies on a future in which enough diversity that some of it will make it through. These metaphors give the impression that no one is acting badly, and all we can do is wait. Archaeology has an image that may contribute to making this situation worse—our colonialist history and masculinist image impacts the power structures of the discipline. This is only one facet of the problem. Looking at the people in power and not seeing themselves reflected is not enough to discourage students and early-career scholars. However, seeing patterns of harassment and bullying, tenure denials, extra service that is less valued, lower pay, and other indignities, and being on the receiving end does a great deal of damage. What do we know about the current state of the gaps in academic archaeology, so we might determine where the most urgent work is needed? What concrete actions might we consider that will promote equity in archaeology?

Sterner, Katherine (University of Wisconsin-Milwaukee)

[232]

Formal Divergence and Functional Concordance: Use-Wear on Late Archaic Cache Bifaces from the Great Lakes

During the Late Archaic to Early Woodland transition, caches of blue gray chert bifaces were deposited throughout the Midwest, often in association with burials. Despite a large degree of variation in their formal expression, these bifaces are usually all grouped together as one artifact type in cache contexts. Their utility between manufacture and deposition has long been the subject of speculation. In 2017, comprehensive use-wear analysis of a sample of bipoined bifaces from the Riverside site, often considered to be blanks for Turkey Tail projectile points, demonstrated that they were, in fact, used prior to deposition. These data are compared to use-wear on a cache of finished Turkey Tail points from the Altenburg View site, located approximately 120 miles southwest of the Riverside site. Use-wear analysis comparing two different formal expressions of these bifaces allows us to expand the conversation about their significance to include not only information about their depositional and formal characteristics but their active social and economic characteristics as well.

Stevens, Jamie [129] see Cordero, Robin

Stevenson, Christopher

[35]

Early Bronze Age Site Location in the Republic of Armenia: A Predictive Model

Archaeological investigations of the Early Bronze Age in the South Caucasus region have raised many anthropological questions concerning early complex societies and human movement across the landscape, especially the organization of small-scale domestic settlements often referred to as the Kura-Araxes Culture. Until recently, Early Bronze sites in the Republic of Armenia had primarily

been located opportunistically, without the support of systematic survey. Using a predictive model, this study recruits documented geospatial data on the known Early Bronze settlement patterns including environmental and geographical factors to develop a system of predicting the probability of additional sites throughout the physical landscape. By integrating GIS mapping technology with archaeological theory on human behavior, this study can help develop hypotheses about Kura-Araxes social organization. It also can contribute to expanding and strengthening ongoing pedestrian and aerial survey projects across Armenia.

Stewart, Benjamin

[78]

Where Did the Meat Go? A Zooarchaeological Analysis and Household Assessment on the Fewkes Site (40WM1)

A Phase III data recovery project on the Fewkes site (40WM1) for the Tennessee Department of Transportation in 1998 recovered a large fauna assemblage, uncovered numerous features, and several structures. Fewkes is a multicomponent site consisting of a 5-mound complex with a plaza, stone-box graves, burial mound, and houses made out of wattle and daub situated on a ridge nose at the confluence of the Little Harpeth River and Boiling Spring located in Williamson County, Tennessee. Data recovered to provide a unique glimpse into Mississippian village life and foodways in the Middle Cumberland River region of Middle Tennessee. An assessment of household archaeology using secondary fauna data and spatial analyses was conducted to determine if there are discernable patterns and evidence of household diet, food preference, socio-political status, ritual, identity, provisioning, feasting, and meat sharing.

Stewart, Brian [76] see Feak, Angela

Stewart, Caitlin (HDR, Inc), Mark Brodbeck (HDR, Inc), Emily Engan (Logan Simpson), William Gulley (HDR, Inc) and Caitlin Stewart

[142]

Life in the Northern Margins of the Prescott Cultural Tradition: a GIS-based Approach for Modeling and Interpreting Local Settlement Systems and Regional Social Networks in the Northern Reaches of Big Chino Valley, Arizona

In 2018, HDR performed an archaeological survey of approximately 5,000 acres in the northern reaches of Big Chino Valley along the southern margin of the Colorado Plateau. This broad valley is a natural travel corridor and is surrounded by mountainous terrain, which provided its prehistoric occupants access to a diversity of ecozones and opportunities for regional interaction. The survey generated an extensive settlement database that includes functional and temporal assessments for over 100 sites. Prior to the survey, few large studies had been conducted in the area and consequently patterns of human adaption to this unique environment are not well defined. The survey identified mostly Prescott Culture sites, but with many containing an unanticipated abundance and diversity of extralocal ceramic wares and lithic tools. This paper presents the results of a GIS-based settlement pattern analysis focused on understanding how prehistoric people took advantage of the opportunities the Big Chino Valley had to offer while exploring patterns of interaction and integration within a larger regional social network.

Stewart, Caitlin [142] see Stewart, Caitlin

Stewart, Carlyn (University of New Mexico) and Alison Livesay (Los Alamos National Laboratory)

[184]

Why Public Archaeology Is Important: Artifacts, Ancestors, and Apricots (and Still No Dinosaurs)

Public and community archaeology can take many different forms and can involve a multitude of people and methodologies. In this poster I offer three case studies located in Northern New Mexico that investigate how Public Archaeology not only answers the question, "is archaeology useful?" but demonstrates that it must be. From the depths of a room at Gusewa Pueblo in Northern New Mexico, to the remnants of a homestead up on the Pajarito Plateau, and down to a railroad embankment along the Rio Grande, involving the public and descendant communities in archaeology leads to an archaeology more relevant to, and representative of, a wider assortment of people. This poster demonstrates three examples of how research can be enriched through community involvement while highlighting the mutual benefits of meaningful collaboration

Stewart, Carolyn (NextEra Energy)

[44]

Discussant

Stinchcomb, Gary [8] see Ferraro, Joseph

Stine, Linda (University of North Carolina Greensboro)

[259]

Hidden Lives

Archaeological Investigations in the backyard of Bloodwood Mansion State Historic Site uncovered an older brick wall that did not align with any recorded structures. This locus was rich in ceramic, bone, and other artifacts and it was interpreted as a possible cabin feature. The U.S. 1850 Slave Schedules listed 37 men, women, and children in residence and two cabins were recorded as slave housing on Hannah and John Motley Morehead's property. Fortunately, Greensboro, North Carolina's Register of Deeds had partially transcribed and digitize old county property deeds. These data provided information about historic Morehead household occupants, both enslaved and free. Examination of the other Picturesque town estates encircling the small city core, using maps,

photographs, and the digitized property deeds, indicated an expanded pattern of urban slavery in the city. The databases such as People Not Property or the Digital Library on American Slavery now available for archaeologists, historians, and genealogists has grown since this 2008–2010 research. As a result, city residents are admitting that Greensboro once housed numerous enslaved African Americans. For archaeologists, the next research step is to continue to map and test the likely location of past estates, including evidence for cabins, outbuildings, and activity areas.

[259]

Chair

Stinson, Susan [1] see Herr, Sarah

Stock, Janet [16] see Perez, Gary

Stock, Jay [38] see Hanson, Annalys

Stocker, Terry

[2]

The Diamond Dotted Grid among Toltec Figurines

The initial impetus in this paper is figurines from Tula, Hidalgo, Mexico, where the “diamond dotted grid” is associated with the goddess Xochiquetzal, a patroness of weavers. Among the Tula examples, some figurines have enhanced motifs with two-lined diamonds and more than one dot inside the diamonds. Indeed, some skirts are entirely embellished with one large diamond and many dots inside and outside the diamond’s lines. However, Tula’s Xochiquetzal figurines have other body type decorations, maybe indicating a workshop signature. It is also suggested that during Early Postclassic times, the “diamond dotted grid” is an ethnic identifier of Otomi speakers/culture. The design association with this goddess continues into the Late Postclassic. Certain examples of Xochiquetzal figurines hold very small children, conveying another of her spiritual/occupational domains: childbirth. Finally, the link between design and deity is supported by a survey of codices where Xochiquetzal sometimes wears the “diamond dotted grid” as decoration on clothing. Because Xochiquetzal is a deity of flowers and fertility, it is suggested that the “diamond dotted grid” might be a semiotic sign of fertility.

Stöckli, Matthias (Universidad del Valle de Guatemala)

[266]

Some More Thoughts on the Study of Prehispanic Soundmakers

The study of prehispanic musical instruments or soundmakers stored in museum collections was certainly foundational to the history of music archaeology. Due to the fact that they were most often decontextualized, those studies used to concentrate on one of two aspects of many of these artifacts, namely, their iconography or their acoustics, more rarely also on both. The holistic interpretation of this double nature continues to be a major concern of organological studies within music archaeology. That such an interpretation of their representational and sonic aspects would call for a thorough spatial, social and cultural contextualization of these artifacts is a claim easy to make, but often difficult to implement on the basis of the archaeological evidence. Another topic of this paper is the tendency in recent music archaeology to prefer the supposedly more neutral term “soundmakers” over “musical instruments” when talking about those artifacts. The underlying concepts of these two terms are also worth to be discussed in some length.

Stokes, Robert (Eastern New Mexico University) and Joseph McConnell (Eastern New Mexico University)

[136]

A Mimbres Mogollon Sacred Landscape as Seen from an Early Classic Period Communal Structure at City of Rocks State Park, Southwestern New Mexico

In this paper, we discuss elements of what we argue were components of a sacred landscape imbued with meaning as seen from a Mimbres Mogollon communal structure at City of Rocks State Park in southwestern New Mexico. The structure dates to the early Classic period and falls into the poorly understood period of time marking the evolution of Mimbres communal spaces from the burning of Late Pithouse period great kivas (AD 950) to the use of oversized surface rooms and plazas at pueblos after AD 1000. We explore why this rare isolated communal structure is where it is and what its role may have been with regard to the adoption of elements of Mesoamerican mythology during the early Classic period. The dramatic near and far landscape elements that encircle the site create a unique viewshed that we argue has clear connections to elements of Mesoamerican mythology and iconography, such as Mimbres-style depictions of the feathered/horned serpent and naturally occurring fertility/regeneration imagery. We suggest that this early adoption and syncretization of elements of Mesoamerican mythology set the stage for the subsequent Mimbres use of the Hero Twins mythology previously discussed by others (e.g., Patricia Gilman and Marc Thompson).

Stokes, Robert (Eastern New Mexico University)

[156]

Chair

Stoll, Anne

[60]

San Rock Art at Diana’s Vow, Zimbabwe: Appreciation, Appropriation, and New Information

Diana’s Vow is a small but celebrated San Bushman rock art site located near Rusape, Manicaland province, Zimbabwe. Known to

European colonists since the early twentieth century, the remarkable figures painted at Diana's Vow caught the imagination of the wider public after the main figures were copied and published in 1931 in *Madsimu Dsangara* by Leo Frobenius. International exhibits that followed spawned a succession of copies, take-offs and fanciful interpretations, culminating in a cameo appearance in Erich von Daniken's 1968 book *Chariots of the Gods*. In June 2019, after an intense four-day "dig" among the archaeological collections and archives of the National Museum in Harare, Zimbabwe, several discoveries concerning Diana's Vow came to light particularly relevant to Cooke's 1976 excavation at the site. Connecting the archaeological data with the more abundant, but somewhat more whimsical, published material has proved daunting but rewarding. Results point to a more rational assessment of painted sites in the Rusape area, many of which may contain evidence of interaction with or subsequent use by non-Bushman occupiers, as does Diana's Vow.

Stone, Abigail (Illinois State University)

[216]

Who Made Mali's Terra Cotta Statuettes? Speculations on Their Creation and Use

Mali's Inland Niger Delta is well-known for its archaeological urban centers, like Jenné-jeno and Dia, and for the terra cotta statuettes produced by their inhabitants. Despite decades of excavations at archaeological sites in the region, very few statuettes have been recovered from secure archaeological contexts. The vast majority of these pieces come from looted sites and are thus divorced from their associated objects and archaeological contexts. This paper reports on a terra cotta statuette recovered during excavations in 2011 at a site called Thièl, located roughly 7 km northwest of Jenné-jeno. The Thièl statuette depicts a woman covered in incised affliction marks giving birth to five snakes. In discussing this statue, I revisit Barbara Frank's 2002 paper to ask again "Who made the Jenné Terra-Cottas" and why? Given the dearth of concrete data, can we speculate on the importance and social role of these figurines? This paper links this rare statuette to the existing art historical discourse on inland delta terra cotta statuettes and uses its archaeological context and ethnographic insights to tie it to the people who made, used, and interred it.

[216]

Chair

Stone, Jane [52] see Nelson, Shaun

Stone, Jessica (University of Oregon), Caroline Kisielinski (University of Kansas), Justin Tackney (University of Kansas), Scott Fitzpatrick (University of Oregon) and Dennis O'Rourke (University of Kansas)

[100]

Tracking Human Dispersals to Palau Using Ancient DNA: Results from the Chelechol ra Orrak Site

Initial settlement of Remote Oceania represents the world's last major wave of human dispersal. While transdisciplinary models involving linguistic, archaeological, and biological data have been utilized in the Pacific to develop basic chronologies and trajectories of initial settlement, a number of elusive gaps remain in our understanding of the region's colonization history. This is especially true in Micronesia where a paucity of human skeletal material dating to the earliest periods of settlement have hindered biological contributions to colonization models. The Chelechol ra Orrak site in Palau, contains the oldest known human remains in Micronesia (3000–1800 cal BP), and therefore provides an excellent opportunity for direct study of initial population dispersals into the region via ancient DNA (aDNA). Here, we present results from research involving the recovery of aDNA from individuals interred at the site. Targeted sequencing of the mitochondrial control region has yielded evidence of haplotypes consistent with Island Southeast Asian origins, while hybridization capture and sequencing of full mitochondrial genomes is further refining population affinities. Together, current results demonstrate genetic distinctiveness between other ancient Pacific Island and modern Palauan data, but still support archaeological and linguistic models suggestive of an Island Southeast Asian origin.

Stone, Jessica [135] see Hanna, Jonathan

Stone, Pamela (Hampshire College)

[131]

Skeletal Transcripts as Ancestral Voices, a Legacy of Interdisciplinary Work: Recognizing the Contributions of Dr. Debra L. Martin to American Archaeology and Beyond

Using the skeleton as a transcript of past experiences is not new, but over the last forty years our ability to develop more nuanced interpretations, and humanistic and scientific models has been impacted by the many exceptional contributions of Dr. Debra Martin. She has guided our professional development and invested decades ensuring that we continue to move the discipline forward, engage in four-field, multidisciplinary research, and to follow best practices while promoting ethical standards. My own work, which considers larger systemic issues that impact and influence how bodies on the margins are understood, has, and continues to be influenced by her support, mentorship, and friendship. I examine how anthropology has constructed the "normal" and the "deviant" body. From the Native American Graves and Repatriation Act, to rethinking the reproductive body, to embodiment and structural violence theory, to my current work on critical White feminism, I pursue research that reevaluates and disrupts "race" and gender science. My intertwining of skeletal analyses within these larger discourses aims to understand the biocultural marginalization of individuals in the past and present, and is emblematic of the way I was mentored to do anthropology; not just from a reductionist lens, but through an intersectional prism.

[131]

Chair

Stone, Pamela [131] see Ralston, Clair

Stone, Sam [195] see Burns, Samuel

Stone, Tammy (University of Colorado Denver)

[156]

Changes in the Use of Communal Space in the Pine Lawn/Reserve Branch of the Mogollon

The diversity of communal spaces and places and their changes through time have been long studied in the southern branches of the Mogollon. Previous studies touching on the communal structures in the mountain branches of the Mogollon (Dugan 2015; Gilman and Stone 2013; Stone 2002) indicate they vary considerably from those to the south but the exact nature of this variation is not well understood. This paper concentrates on changes in the use of communal space (great kivas and plazas) in the Pine Lawn/Reserve area of central New Mexico and how it changes through time to better understand this variability. Specifically, great kivas continue to be used during the masonry period, and plazas become more defined by architectural enclosures. Concentration will be placed on the location of the communal space within the community through time as well as changes in size and internal features.

Stoner, Wesley (University of Arkansas)

[196]

Discussant

Stoner, Wesley (University of Arkansas)

[237]

Costly Signaling and the Transmission of Formative Pottery Styles in Mesoamerica

I explore Hector Neff's ideas about costly signaling to investigate the spread of Olmec-style pottery with emphasis on Central Mexico, where Deborah Nichols and I have analyzed a large sample of Formative pottery via neutron activation and petrography. During the Ayotla phase (1400–1150 cal BC) potters in the Basin of Mexico replicated Olmec vessel styles that were developed in the Southern Gulf Lowlands. Import of a small percentage of vessels from the Gulf Lowlands, and other locations, provided a template for the horizontal transmission of the style. Potters in the Basin of Mexico quickly copied the style which threatened the signaling status of trade pots and the heavy costs of procuring foreign over long distances was no longer justified. Olmec-style pottery import quickly ceased during the Ayotla phase, with some exceptions. By the Manantial phase (1150–900 cal BC), Basin of Mexico potters experimented with earlier Ayotla phase techniques and combined double-line-break motifs with a white slipping technique to create a new pottery style that came to dominate Mesoamerica during the early Middle Formative. I argue that a similar process of costly signaling drove the initial adoption and subsequent copying of this new style in regions outside Central Mexico.

Stoner, Wesley [168] see Marino, Marc

Storey, Rebecca (University of Houston)

[152]

Discussant

Storey, Rebecca (University of Houston)

[181]

Discussant

Straight, Kirk

[126]

Once Upon a Time in the West: Pottery Consumption at Palenque, a Compositional Perspective

The ceramic sequence for the Lowland Maya center of Palenque, in modern-day Chiapas, Mexico, is reviewed. Compositional analyses, including Instrumental Neutron Activation Analysis (INAA), reveal pottery consumption patterns through time. The presentation focus is the Carbondale Collection, assembled by the late Dr. Robert L. Rands and curated by Dr. Ronald L. Bishop (Smithsonian Institution). Pottery specimens were initially retrieved from excavations into the major architectural complexes at Palenque during the heyday of exploration at the site—through the 1950s and early 1960s—complimented by samples from regional centers in the settlement hierarchy. The sample size, geographic coverage, and battery of compositional analyses facilitate discussion of intraregional pottery procurement patterns from the perspective of a first-order center.

Strait, Madeleine (Field Museum)

[218]

Discussant

Strasser, Thomas (Providence College)

[175]

The Asphendou Cave Petroglyphs: Paleolithic Art on Crete

The petroglyphs at Asphendou Cave (southwest Crete) were first published in the early 1970s. Determining the absolute chronology of the engravings has proven problematic. Scholars have posited Paleolithic to Iron Age dates. Recently a team has documented the engravings using up-to-date scientific methods of photography, and to reevaluated the likely date of the engravings. Using photogrammetry, the project produced a detailed 3D model of the flowstone where the engravings are carved. Photogrammetry

reveals four carving events, with different tools for various levels. The engravings are similar to a palimpsest in stone. Analysis of 3D models shows that the herd of quadrupeds are the oldest element. Comparison of the iconography to recently discovered fossil data demonstrate that the quadrupeds represent a dwarf endemic deer (*Candiacervus ropalophorus*) that went extinct at the end of the Upper Palaeolithic. These animals therefore represent the earliest figural art yet discovered in Greece as well as provide the first evidence that places the humans and the extinct deer together.

Stratford, Dominic [11] see Val, Aurore

Strauss, André [244] see Ferraz da Silva, Tiago

Strauss, Stephanie (Dumbarton Oaks Research Library and Collection)

[191]

Epi-Olmec Narrative Art: Sculpture and Script at a Crossroads

In the study of Mesoamerican art and epigraphy, Epi-Olmec narrative sculpture stands at both a geographic and temporal crossroads. Situated between more widely studied visual culture programs to the west and east, and concentrated in the Late to Terminal Formative eras, Epi-Olmec sculpture serves as a unique case study for Mesoamerican narrative art. This paper outlines the guiding visual precepts and compositional principles that unify Epi-Olmec sculptural narratives and addresses both pictorial monuments and those that incorporate hieroglyphic annotation. Widening the lens to include the sculptural corpus from Cerro de las Mesas, furthermore, highlights the perhaps surprising longevity of this visual culture program and indicates that Epi-Olmec narrative art may have been more influential than once imagined.

Strawhacker, Colleen [125] see Fertelmes, Craig

Strawn, James [180] see Miller, D. Shane

Strickland, Scott (St. Mary's College of Maryland)

[251]

Indigenous Viewsheds in the Chesapeake

Broad analysis of settlement patterns often use proximity to environmental resources as the primary means of explaining the spatial relationships among known archaeological sites. What is often overlooked is the role of the human experience within that landscape, including the visual experience. By taking advantage of and engineering certain vantage points, Native people may have enhanced the physical presence of certain sites for cultural/social reasons as well as for possible communication and defense. Using examples in the Potomac, Rappahannock, and York River valleys, viewsheds are examined as an additional research avenue for centers of cultural importance. This analysis is made possible by employing publicly available lidar data and terrain models using GIS and 3D modeling software.

Striker, Sarah [98] see Hegmon, Michelle

Stroebe, Kelsi [38] see Fahey, Brian

Stroth, Luke (University of California, San Diego), Mario Borrero (University of California, San Diego) and Geoffrey Braswell (University of California, San Diego)

[197]

Late and Terminal Classic Lapses in Architectural Standards and Practices at Nim Li Punit (AD 150–830), a Maya Site in Southern Belize

There was great variation in ancient Maya architecture, from Preclassic megalithic architecture to the gaudy Puuc Mosaic of the Terminal Classic northern lowlands. The southern Belize region is host to a unique Classic period architectural tradition characterized by masonry tombs, ball courts enclosed within walled structures, covering natural hills in a façade of stones to create the appearance of grand temples, and the superstructure of most buildings made of perishable materials. Nim Li Punit (AD 150 to 830/850) exhibits these features, but recent excavations by the Toledo Regional Interaction Project have yielded examples of an apparent lapse in architectural standards during the Late and Terminal classic periods. These include closing plazas from public view, the construction of redundant, improvised buttress walls, the deliberate deconstruction of structures, and looting of tombs and caches. These instances occurred throughout the site, although some occurred after the end of elite occupation of the site. In this paper, we make comparisons to other examples of architectural modifications, such as Postclassic shantytowns in Calakmul, cannibalized defensive structures in the Petexbatun, and evidence of earthquakes at the nearby site of Lubaantun, to try and explain changes in architectural standards and practices at Nim Li Punit.

Stroth, Luke [130] see Borrero, Mario

Stuart, David (University of Texas, Austin), Tomás Barrientos Q. (Universidad del Valle de Guatemala) and Marcello Canuto (Tulane University)

[223]

The Kaanul Dynasty and the Early History of the Northwest Petén

Over the past two decades it has become increasingly clear that the ancient Maya political landscape was permeated by regional systems of political asymmetry. These hegemonic networks fluctuated through time, but the steady presence of a few especially dominant polities shows that they were a persistent feature with very real socio-political effects. Based on research carried out at the sites of Achiotal and La Corona, we offer a general interpretation of the historical and socio-political development of one of these regional polities allied with the powerful Kaanul dynasty. We suggest that archaeological and epigraphic data from the northwestern Petén dating to before 600 CE demonstrates this region's strategic role in Kaanul's early expansion and influence, when its court was based at Dzibanché. The evidence illuminates how its regional hegemony over much of the southern Maya Lowlands was achieved.

Stuart, David [138] see Hurst, Heather

Stubing, Michael [79] see Ryden, Ronald

Stueber, Daniel (University of Victoria) and Richard Rosencrance (University of Oregon)

[236]

An Updated View from Redfish Overhang: Western Stemmed Technology and Chronology in Custer, County Idaho.

B. Robert Butler, Kathryn Sargeant, and a crew from Idaho State University excavated Redfish Overhang, a small rockshelter in central Idaho, in 1971. They recovered a Western Stemmed Tradition (WST) biface cache and recorded an associated hearth feature that dated to between 12,500 and 10,500 cal BP. Using 2D qualitative comparisons with projectile points from the Intermountain West, Sargeant and Butler posited the cache was most similar to the Haskett type. We engaged in a reassessment of Redfish Overhang for three reasons: (1) Sargeant provides vague descriptions of the spatial relationship of the hearth and the cache; (2) the radiocarbon dates were obtained on composite charcoal samples using conventional radiocarbon dating methods; and (3) knowledge of Haskett reduction technology has grown considerably since Sargeant's investigation. Our analysis indicates that there is indeed a close relationship of the hearth and cache and that they more precisely date to ~11,320–11,235 cal BP. Technologically, the reduction techniques present in the early and late stage bifaces, as well as the finished point are not consistent with "classic" Haskett technology from neighboring regions.

Sturtz, Sara, Geoffrey Smith (University of Nevada, Reno), Nicole George (University of Nevada, Reno), Derek Reaux (University of Nevada, Reno) and Richard Rosencrance (University of Oregon)

[195]

Renewed Investigations at Leonard Rockshelter

Leonard Rockshelter is located in Pershing County, Nevada. Initially mined for bat guano, workers discovered artifacts in 1938, prompting a visit by Robert Heizer. Heizer returned to excavate the site in 1950 and reported more than 2 m of stratified deposits from which he recovered a modest assemblage of perishable and lithic artifacts. Of interest to the University of Nevada Reno's Great Basin Paleoindian Research Unit (GBPRU) was Heizer's find of obsidian flakes in association with guano that returned a radiocarbon date of 11,200 14C BP. This Clovis-era date prompted the GBPRU to return to the site in 2018 and 2019 to evaluate Heizer's claim of a potential Clovis-era occupation and gain a better understanding of the site's stratigraphy. We discuss our 2018 and 2019 excavations with a focus on understanding the age of the deposits and Leonard Rockshelter's importance in the western Great Basin.

Su, Kai (Washington University, St. Louis)

[34]

A Chronology for Moat Construction and Sedimentation at Chengziya, a Late Neolithic Urban Settlement in Eastern China

As the site that defines the Longshan Cultural Phase in China, Chengziya has produced few absolute dates over decades of research. The excavation of moat structures in the northwestern corner of the site in 2017 provided a new opportunity to collect materials for dating from secure archaeological contexts. Thirteen radiocarbon dates and twenty-two OSL (optical stimulated luminescence) dates were obtained from a stratigraphic sequence and evaluated within a Bayesian interpretive framework to assess the timing and temporality of occupation at the site, from the Longshan through Zhou periods. Two models consistently show that the Longshan occupation at Chengziya started in 2510–2415 cal BC (68.2%) and ended in 2245–2085 cal BC (68.2%). The Yueshi occupation started in 2155–2030 cal BC (68.2%), supporting the argument for continuous occupation from the Longshan to Yueshi period at Chengziya. The early transitional period between the Longshan and Yueshi contradicts the understanding of local archaeologists, which can be explained in terms of new way of thinking archaeological cultures in this region, dating materials and new findings at the site.

Suárez, Rafael (Universidad de la República, Uruguay)

[73]

Bruce Bradley: His Important Legacy and Contribution to Advance in Paleoamerican Lithic Technology in Uruguay

When I was still a grade student, I read Bruce Bradley's works with great enthusiasm, his work on lithic technology, projectile points and specialized bifaces, left a strong influence on my academic background. Later I met Bruce, with whom we shared several adventures, I learned a lot during the time we collaborated and he left us an invaluable legacy for archeology in Uruguay. We shared the discovery and excavation in rockshelters and caves, the recognition of outcrops of raw materials, as well as the analysis of

materials in museums and laboratories, conferences, postgraduate courses and replication of the “Fishtail and” Tigre “ technology. Bruce has always been an extremely generous person who shares his knowledge and teaches, from the academic but also from the human point of view. During many of our adventures in Uruguay we have gone through adverse conditions, however Bruce never complained. Regarding lithic technology and experimental archeology, his teachings always have something special. Bruce has left a strong mark on archeology in Uruguay, here I present some of the advances he has developed in relation to lithic technology and experimental archeology

Sugiura, Yoko (Instituto de Investigaciones Antropológicas, UNAM) and Gustavo Jaimes Vences

[133]

Vida cotidiana y relaciones interregionales en Santa Cruz Atizapan, México Central: Del Clásico al Epiclásico

La cotidianidad nunca puede concebirse como prácticas autocontenidas. A partir de la suposición de que la autarquía no existe aún en el nivel más elemental de los quehaceres diarios y de que la relación con otras regiones constituye una parte fundamental en la conducción de la vida cotidiana, se considera pertinente profundizar en la problemática en torno a las interacciones intra e interregionales. Esta ponencia se enfoca en las redes de intercambio de larga distancia que se establecen, en el Clásico Tardío al Epiclásico, con diversas regiones del Altiplano Central. Se centra en la región del valle de Toluca y como un estudio casuístico, se refiere al sitio arqueológico de Santa Cruz Atizapan, Estado de México. Los productos obtenidos a través de dichos mecanismos tuvieron un papel preponderante en el contexto de la vida cotidiana como los artefactos líticos y cerámicos, así como los ingredientes necesarios para la práctica culinaria como la sal. La importancia y el significado de dichos materiales en la vida cotidiana se abordan mediante los resultados de los análisis macroscópicos, así como los de diversas técnicas arqueométricas.

Sugiyama, Nawa [244] see Singleton, Robin

Sullivan, Alan (University of Cincinnati)

[117]

Discussant

Sullivan, Alan (University of Cincinnati)

[255]

Discussant

Sullivan, Julia [234] see Becker, Hilary

Sullivan, Kelsey (University of California, Riverside), Kenichiro Tsukamoto (University of California, Riverside) and Jaime Awe (Northern Arizona University)

[232]

Specialization in the Hinterland: Lithic Production and the Urban Landscape at the Took' Witz Group, El Palmar, Campeche, Mexico, and across the Maya Lowlands

Dispersed urban landscapes are mosaics of individual interactions through many social and economic processes. Large scale lithic production provides a lens for understanding the interconnected nature of economies in hinterland communities and central polities, yet it remains relatively understudied in Classic period Maya society (AD 250–850). Growing evidence, however, suggests that patterns exist in ancient Maya lithic production, which is useful in understanding the cultural practices related to this important economic activity. In this paper, we will explore a hinterland community, Took' Witz, located in the periphery of El Palmar, a large Classic Maya site in southeastern Campeche. The site has evidence of several large-scale biface production areas. We will discuss the results of recent excavations of a lithic workshop at the site and the subsequent debitage analysis, as well as the relationship between independent producers and polity-wide complex economic systems. These data will be juxtaposed to other known lithic production communities in the Maya lowlands, with a particular focus on central Belize, to advance the understanding of ancient Maya economies related to stone tools.

Sullivan, Lauren [168] see Awe, Jaime

Sullivan, Lauren [53] see Stanyard, Zachary

Sullivan, Timothy [168] see López Bravo, Roberto

Summers-Wilson, Rachel (University of Montana), Meradeth Snow (University of Montana) and Michael Searcy (Brigham Young University)

[169]

Mitogenome Analysis of the Elite Individuals Interred in the House of the Dead Complex at Paquimé (Casas Grandes), Mexico

This research project investigates the elite population interred in The House of the Dead at the archaeological site known as Paquimé (Casas Grandes), Mexico during the Medio Period (1200–1450 AD). The subfloor tomb contains the remains of at least 12 individuals, as well as possibly two high ranking individuals. The nature of some of the burials suggests they may be sacrifices of non-locals. Population genetics can be applied to archaeological data in order to test hypotheses on the social complexity of any society (Gamble et al. 2001). The combination of mortuary treatment, archaeological and whole mitogenome analyses of this rich

and elaborate burial not only provides a means of looking at the maternal relationship that exist between the different interments, but it will also give us a better understanding of various elements of past social organizations, and may mark inequality including prestige, rank and power, and how this was expressed in Mesoamerican and Southwestern elites.

Sun, Nan (University of Houston), Alan Brandon (University of Houston), Steven Forman (Baylor University), Michael Waters (Texas A&M University) and Thomas Stafford (Stafford Research Laboratories)

[19]

A Volcanic Origin for Younger Dryas Geochemical 1 Anomalies ca. 12,900 cal BP

The Younger Dryas (YD) cooling event at 12.9 ± 0.1 ka is proposed to have resulted from a bolide impact or airburst. Purported impact markers peak at/near the YD basal boundary layer. However, there is a lack of marker reproducibility and chronological control for many YD sites. Here, we report $^{187}\text{Os}/^{188}\text{Os}$ ratios and highly siderophile element abundances in a well-dated sediment section at Hall's Cave, Texas. Unradiogenic $^{187}\text{Os}/^{188}\text{Os}$ was obtained in five horizons spanning across the section. Previously surface films on spherules from the Younger Dryas site in Melrose, Pennsylvania have low $^{187}\text{Os}/^{188}\text{Os}$ ratios of ~ 0.113 . Two-endmember mixing between the spherule surface films and Hall's Cave sediments successfully reproduce the Hall's Cave unradiogenic $^{187}\text{Os}/^{188}\text{Os}$ ratios, indicating Melrose and Hall's Cave were modified by the same event(s). Mixing between chondrites or iron meteorites with upper continental crust do not duplicate the HSE abundances of the Hall's Cave unradiogenic Os samples. Instead, volcano gas condensates have HSE abundance patterns and ratios that overlap with these Hall's Cave samples. Therefore, the most likely explanation for the HSE and Os isotope systematics of the unradiogenic Os samples is episodic, distant volcanic emissions in the Northern Hemisphere being preserved in Hall's Cave sediments.

Sun, Yufeng (Washington University, St. Louis), Xinyi Liu (Washington University, St. Louis), Rachel Reid (Virginia Polytechnic Institute and State University), Zhijun Zhao (Institute of Archaeology, China Academy of Social) and Jixiang Song (Sichuan University)

[35]

Plant Stable Isotopic Analysis Reveals the Water Management Strategies of Wheat and Barley Cultivation in the Bronze Age China

There has been a growing interest in the process of the eastern expansion of the 'Neolithic founder crops' from southwest Asia to China. By c. 1,500 cal BC, the geographical distribution of free-threshing wheat and naked barley, stretched from the Atlantic to the Pacific. In this paper we consider the environment challenge for the cultivation of southwestern Asian originating cereals in the monsoonal East Asia. Carbon isotopic ratios obtained from macro-botanical remains provide us with insights to understand water management strategies in the past, as $\delta^{13}\text{C}$ values measured from charred grain can be employed as a direct proxy to learn the water status when the grain was forming. In this study, 50 wheat and 22 barley grains recovered from archaeological sites across China were analyzed. Our results indicate that wheat and barley cultivated in western China during the Bronze Age were well watered. In eastern China, however, while wheat fields were well watered, barley was grown in stressed water conditions.

Sundstrom, Linea (Day Star Research)

[103]

Lame Bull Speaks: The Lukin Ledger and Pikuni Blackfoot History

A Pikuni Blackfoot notebook created sometime between 1904 and 1911 and linked to the descendants of Lame Bull contains a winter count, a record of two treaty conferences, and a list of the leaders of various nations comprising the Blackfoot Alliance, recorded as pictographs. An unknown person, perhaps Peter Lukin, has annotated some of the pictographs in English. The record provides a Blackfoot perspective on contact-era history. In addition, the specifics of the pictographic system provide a key to interpreting some northern Great Plains rock art.

Sunell, Scott (Statistical Research Inc.)

[247]

Spatial and Temporal Trends in Medicine Use among Immigrant Communities in Historic Downtown Redlands, California

Located in the historic center of Redlands, California, the Downtown Redlands Archaeological Project investigated the use and deposition of household goods among Chinese and Mexican immigrant communities from the 1880s through the middle of the twentieth century. The rich assemblage from this project includes a large quantity of complete medicine bottles and diagnostic glass shards spanning the period of occupation. We present an analysis of the types of medicines in use in both communities in the context of ethnographic and historic data about socioeconomic status and ethnic identity. We identify changes in this assemblage over time, tracking the use of both patent medicines and the products of professional pharmacies during a period of rapid professionalization in the pharmaceutical industry. We also identify differences in the distribution of medicines across the project area, because the diversity and the richness of the medicine bottle assemblage varies substantially between Chinese and Mexican households. We evaluate both types of variation in the use of medical products. We address this topic within and across these communities through time, and connect it to the effectiveness of the medicines themselves, linked to their cost and availability, as well as to household preferences and ethnic identity.

Sunell, Scott [247] see Grenda, Robert

Supernant, Kisha (University of Alberta, Department of Anthropology) and William Wadsworth (wwadsworth@ualberta.ca)

[202]

Sensing Layered Histories: Applications of Multiple Remote Sensing Techniques to Métis Archaeology in Canada

Remote sensing is increasingly in demand by Indigenous communities to help detect and preserve the material remains of the past with non-destructive methods. Applications of remote sensing in the post-contact period, however, have typically been surveys

designed for the prospection of large colonial structures with less focus on more ephemeral and short-term occupation Indigenous sites. The Métis, an Indigenous nation, emerged alongside the North American fur trade during the seventeenth century and became a distinct people. During the nineteenth century, the Métis adopted a highly mobile lifestyle, centered around bison hunting, where they would form temporary villages to overwinter on the northern plains. Our research used remote sensing methods, specifically ground-penetrating radar (GPR), magnetic gradiometry, multi-spectral, thermal, and orthographic drone imagery to survey the mid-nineteenth-century Métis wintering site of Chimney Coulee (DjOe-6), near Eastend, Saskatchewan, Canada. The multi-component survey delineated wood wall remains and chimneys that were determined to be the ephemeral remains of Métis cabins, with the features corroborated through archaeological excavations. Refining the methods of remote sensing can help protect Indigenous histories and can contribute to modern groups sense of identity, homelands, and Indigenous rights.

[202]

Chair

Supernant, Kisha [1] see Hodgetts, Lisa

Surovell, Todd [270] see Herron, Molly

Surovell, Todd [82] see Holt, Evan

Surovell, Todd [180] see Mackie, Madeline

Surovell, Todd, [244] see Ricketts, Macy

Šušnjic, Dalibor [35] see Zavodny, Emily

Sutherland, Kenneth (Louisiana State University) and David Chicoine (Louisiana State University)

[182]

Early Horizon Plant and Animal Use in Ancient Peru: Insights from Soil Sample Analyses from Caylán (600–200 BCE), Nepeña Valley

This paper discusses results of analysis of soil samples excavated during fieldwork at the Early Horizon settlement of Caylán (600–200 BCE) in the Nepeña Valley, Peru during the 2010 field season. Over 18 L from 40 dry-sieved samples was recovered from over 460 m² of excavated area at Caylán. The analysis details the ecofacts and artifacts which were recovered from four different excavation areas at the settlement. These areas include both public and private contexts, both within enclosure-walled compounds and in the avenues and passages between compounds. The distribution of these macrofloral and macrofaunal remains, including variations in the presence or frequency of ecofacts at different contexts, provide insight into the foodways, material culture, and lived experiences of those who originally deposited them as well as the social functions of the different areas. Previous research has discussed shellfish resources, macrofloral ecofacts, and human fecal ecofacts recovered at the settlement. This research complements the previous research by looking at new data obtained using a different method, and expands the discussion of the social and political relevance of the macrofloral and macrofaunal remains discovered at Caylán.

[182]

Chair

Sutter, Richard (Purdue University, Fort Wayne), Gabriel Prieto (University of Florida), Jordi Rivera (University of Florida) and Celeste Gagnon (Wagner College)

[174]

The Biological Relatedness between the Salinar (400 BC–AD 100) and Other Prehistoric Populations of the North Coast of Perú: A First Approximation Using Nonmetric Dental Traits

Following the demise of the Early Horizon (800–400 BC) and Chavín influence in the Central Andes, archaeologists—historically—have hypothesized that cultural changes on the north coast of Perú, such as the “White-on-Red” cultural traditions, as well as the Salinar, were due to an influx of highland peoples. We test this hypothesis through biodistance comparisons of Salinar skeletal populations from the Moche Valley to other populations from the region using genetically influenced tooth trait frequencies. Preliminary results support the hypothesis that there was an influx of people into the region sometime leading up to the terminal Early Horizon Salinar era (400–100 BC), who interbred with pre-existing Late Preceramic (2100–1800 BC) and Initial Period (1500–800 BC) coastal peoples. The implications of these results attests to the possibility of more dynamic coastal populations than previously thought, including the study of the impact of ancient highland migrations into ancient maritime communities along the North Coast of Peru.

Sutton, Mark [258] see Burnell, Taylor

Sutton, Wendy (USDA Forest Service)

[92]

Moderator

[92]

Discussant

Suyuc, Edgar [163] see Hansen, Richard

Swanson, Steve [229] see Arp, Ryan

Swedlund, Alan (University of Massachusetts Amherst)

[131]

In Recognition of Prof. Debra Martin

I have been very fortunate to be a teacher, mentor, colleague, collaborator and friend of Dr. Martin for over 30 years. Role reversals do happen over such an extended period of time, so now I find myself also becoming a student of Dr. Martin's, learning and re-learning from her on the topics of Southwestern and Pueblo topics in bioarchaeology and the history of violence. In this paper I recount some of our many connections over the long and continuing arc of her career, illustrate her importance to my own work and the intersections of our research interests, and give praise to her many accomplishments and richly deserved recognition by this award.

Swenson, Edward (University of Toronto)

[32]

Discussant

Swenson, Edward (University of Toronto)

[210]

The Aesthetics of Violence and the Creation of Place and Political Subjects in the Ancient Americas

The inherent physicality of violence as actions that inhibit, harm, and destroy can explain the central role played by architecture in political domination. Theorists tend to focus on how violence saturates everyday spaces as hegemonic instruments in social reproduction or stress instead of how violence creates distinctive places removed from normative space-time. Farmer's notion of structural violence, Bourdieu's theories on symbolic violence, or Rodger's concept of "infrastructural violence" exemplify the first perspective, while Agamben's spaces of exception and Foucault's writings on heterotopia explore how violence creates intense states of difference. I explore how built environments perpetuated political inequality and ideologies of alterity in non-capitalist societies. I focus on the aesthetics of violence that informed the design of religious architecture in the ancient Americas and explain why "sanctuaries" often doubled as spectacular arenas of violence. I argue that religious ideologies that explicitly aestheticized sacrificial forms of violence as a positive force in the reproduction of cosmos, life, and society spatialized a "politics of affect" that conditioned the deep structural forms of violence more commonly studied by geographers. Although affording different experiences than a concentration camp or anti-immigrant wall, religious architecture equally shaped political subjectivities and legitimized structures of inequality in past societies.

Swogger, John (Archaeological Illustrator)

[100]

A Different Way to View the World: Comics, Outreach, and Cultural Heritage in the Islands of Yap and Palau, Micronesia

Comics can not only be an engaging and accessible medium for public outreach in archaeology, they can also help strengthen connections between such outreach and other aspects of cultural heritage. Applied comics utilise specific kinds of visual storytelling devices such as explicitly identified narrators, visual contextualization and a constructivist approach to information to communicate archaeological data, process and interpretation. Using the same approaches to communicate other kinds of related stories about the past can place archaeological outreach within a much wider conceptual milieu—one that embraces ecological, cultural, historical and biographical storytelling about the past. This has significant implications within both the broad context of community-based outreach in the Pacific, and specifically with reference to highly sensitive issues such as development, climate crisis and shifts in regional geopolitics. Such an approach offers the opportunity to develop a different kind of public voice and visibility for archaeology, while simultaneously promoting a more networked place for archaeology within community-based heritage working. This paper will draw on recent comics projects in the Pacific dealing with archaeological excavation and research, traditional culture and educational practices, government cultural heritage policy and ongoing post-WWII reconciliation.

Swope, Karen (Statistical Research Inc.)

[247]

Chair

Swope, Karen [247] see Grenda, Donn

Szpak, Paul (Trent University), Michael Westbury (University of Copenhagen), Øystein Wiig (University of Oslo), Arthur Dyke (McGill University) and Eline Lorenzen (University of Copenhagen)

[64]

Holocene Environmental Changes Recorded in Bowhead Whale Bone Collagen Isotopic Compositions

This poster presents stable isotope measurements from the bone collagen of bowhead whales collected in the Canadian Arctic (NW Atlantic) and Svalbard (NE Atlantic) dating from the Early Holocene to the present day. Both populations are characterized by declining $\delta^{13}\text{C}$ values throughout the Holocene, with stronger trends in the NW Atlantic. The $\delta^{15}\text{N}$ values are stable in the NW Atlantic, but markedly decline through the Holocene in the NE Atlantic. We discuss these changes with respect to changing environmental conditions in the two regions.

Szpak, Paul [243] see Hyland, Corrie

Szpak, Paul [76] see Routledge, Jennifer

Szpak, Paul [64] see Scott, Michael

Szumilewicz, Amy (Southern Illinois University, Carbondale)**[242]***Middle Sicán Canvas, Cloth and Woven Textiles: The Media, Aesthetics, and Roles of Textile Painting in the Andes*

The primacy of textile arts and their utility as a communicative device is well documented in ancient Andean contexts. To augment this body of knowledge, this poster presents unpublished examples of three types of textiles associated with the Lambayeque region of the north coast of Peru during the Middle Sicán period (900–1100 CE): painted cloth, woven patches, and mixed-media “canvases.” It compares context, style and iconography of painted cloth and woven textiles housed at the Ethnographic Museum in Berlin to cross-crafted textile funerary furnishings found in situ in elite tombs at the site of Sicán. The iconographic and thematic subject matter of the former are remarkably variable, portraying anything from mundane scenes of everyday life to a wide repertoire of representational flora and fauna. This contradicts the more typical characterization of Sicán as having repetitive, religiously-centered art focused on a single, front-facing deity. Finally, the attribution of the Berlin collection, with original provenance in Pachacamac, an important pilgrimage site 750–800km south of the Lambayeque valley, to Sicán offers important insight into the breadth and extent of the Sicán religious-political sphere of influence.

Szumilewicz, Amy [105] see Shimada, Izumi

Szymanski, Ryan (Petrichor Research)**[234]***Population History and Economic Change through the Iron Age in Western Kenya: Paleoenvironmental and Archaeological Evidence*

The last several millennia of cultural history in the western Kenyan highlands have been marked both by punctuated periods of considerable demographic and economic change, and by continuous in-situ processes of genetic, linguistic, and economic interaction and admixture. Historical linguistic and archaeological models of the peopling of this region have, among other contributions, offered a rough timeline for the “arrival” and incorporation of various food production and landscape management practices into the economic repertoire of western highland populations. Archaeobotanical and mycological evidence is presented here which, in concert with a review of existing archaeological and historical-linguistic knowledge, broadly supports previously advanced narratives of the development of this region’s economic lifeways over the last ca. 1500 years. Greater reliance on mixed farming/pastoralism and plant cultivation are argued to have characterized the period ca. 700 BP to the present, replacing earlier strategies emphasizing tuber cultivation, herding of domestic stock, and hunting-gathering and/or exchange with foraging groups. A centuries-long period of landscape change (ca. 500–900 BP), during which fire-based land management practices were increasingly employed, is posited to be a key timeframe for the development of landscape management strategies enabling what became traditional lifeways during the late Iron Age.

Tackney, Justin [244] see Potter, Bethany

Tackney, Justin [100] see Stone, Jessica

Taivalkoski, Ariel (University at Buffalo)**[270]***Puffin Heads and Albatross Limbs: An Examination of Avifaunal Usage from the Rat Islands, Alaska*

Human groups have used birds in a variety of ways, from food, to raw material for tools, to clothing. In addition to their more practical usages, birds often play a significant role in cosmologies and myths. However, due to poor preservation and excavation bias bird remains have only recently begun to be studied in depth. The archaeological sites of the Aleutian Islands have very large avian bone assemblages due to excellent taphonomic conditions which allows rigorous study from which we can study not only local relationships with birds but also develop models for other times and places. Comparing the patterns of archaeological skeletal part representation with oral histories and ethnographies reveals the interplay of the symbolic and ‘material’ aspects of the relationship between birds and the residents of the Aleutian Islands. This presentation will examine a case study from KIS-050 and RAT-31 to examine how skeletal part representation can vary greatly even within island groupings and can reveal cultural and environmental changes. Specifically, the presence of puffin heads at KIS-050 versus the abundance of albatross head/parts at RAT-31 illustrates how avian use varied between the islands due to cultural factors and site usage.

Takatsuchi, Ryohei**[248]***The Huastec Collection at the National Museum of Anthropology*

Building and modeling natural resources for aesthetic or utilitarian value, Pre-Columbian artifacts encapsulate the Mesoamerican past. However, the afterlife of these objects would have not been perceived to be in museums. Observing decontextualized material and visual culture, the challenge is to re-create and rethink the object’s life and value. The National Museum of Anthropology (Museo Nacional de Antropología) in Mexico City houses one of the largest Pre-Columbian collections in Mexico and the world. As diverse and grand the collection is, it is not well known beyond the museum itself. Documenting and registering the Huastec collection, under the supervision of Dr. Rebecca Gonzalez-Lauck (Curator of the Gulf Coast), the provenience and provenance of the material is slowly being determined. Cross referencing the inventory and registration numbers with the identity cards of the individual pieces has uncovered the complexity of understanding an uncharted collection of artifacts. In the process of creating a new home for the artifacts the museum is also taking the objects out of context. In this paper, I explicate and explore the process of documenting and registering the artifacts for further study of the Huastec culture and the collection at the National Museum of Anthropology.

Tamberino, Anthony [147] see Liss, Brady
 Taliaferro, Matthew [77] see Morgan, Robert

Tanasi, Davide (University of South Florida), Robert Brown (Australian National University), David Cardona (Heritage Malta) and Benedict Lowe (University of North Alabama)
[104]

The Virtualization of the Archaeological Site and Museum of the Roman Domus of Rabat (Malta)

In 1881, the remains of a large peristyle house containing rooms adorned with very fine mosaic floors in a late Hellenistic style were uncovered at Rabat in Malta. Further excavation carried out in 1920–1925 pointed out that such 'Domus', toward the mid-first century CE, must have been occupied by a high rank individual likely close to the court of emperor Claudius. In early summer 2019, a long term international collaborative interdisciplinary research project (Melite Civitas Romana Project) aimed at reassessing the site of the Domus of Rabat started out with an overall remote sensing campaign in preparation for the excavation resuming in 2020. Part of that campaign was the Terrestrial Laser Scanning (TLS) of the entire archaeological site of the Domus and digital micro-photogrammetry (DP) to create high quality 3D models of the mosaic floors of rooms C, D, E and F. The 3D models obtained will be used to update the existing technical documentation of the site and create a system of reference for the future investigation but also for a systematic reappraisal of all built stratigraphic units, contributing to the reinterpretation of the function and chronology of important sections of the villa.

[104]

Chair

Tanasi, Davide [104] see Bonacini, Elisa

Tang, Guitao [45] see Zhai, Shadong

Tankersley, Kenneth (University of Cincinnati), Maria Saniel-Banrey (University of Cincinnati) and Stephen Meyers (University of Cincinnati)

[63]

The Hopewell Comet Airburst Event

This paper provides the first direct positive evidence of a comet airburst event, which occurred during the Middle Woodland cultural period. Using inductively coupled plasma mass spectrometry (ICP-MS) elemental analysis, scanning electron microscopy (SEM), and energy dispersive analysis of X-rays (EDAX), we found positive Pt and Ir anomalies, micro-meteorites, micro-tektites, and macro-meteorites in archaeological strata from across the northern Western Hemisphere, which date just prior to the CE 535–536 extreme weather event. These independent proxies suggest a time-correlative atmospheric deposition of meteoric debris. The greatest concentration of Pt, Ir, and meteoric debris occur in the Ohio River valley and likely resulted from a high altitude (i.e., > 5 km) airburst. This airburst event would have had both a short-term and long-term impact on the Indigenous population of this region. Additionally, the airburst debris-rich stratum provides a new chronostratigraphic marker for late Holocene archaeological strata with limited chronometric control.

Tankersley, Kenneth [258] see Lentz, David L.

Tankersley, Kenneth [63] see Zedaker, Dylan

Tankosic, Zarko [199] see Psoma, Aikaterini

Tardio, Katie (University of North Carolina, Chapel Hill)

[27]

Fauna, Food, and Factories: Zooarchaeology at Roman Tarraco, NE Spain

This paper presents my ongoing dissertation research on zooarchaeological assemblages from the ancient Roman city of Tarraco and its outlying rural villas in northeastern Spain, from the third century BCE to the third century CE. Through a contextual analysis of animal remains, I test models of continuity and change in the Iberian animal economy associated with the Roman conquest of northern Spain. My research targets evidence for the reconstruction of systems of production, distribution, and consumption from this important urban center to better assess how the urban animal economy functioned, as well as how all classes of society responded to Roman influence. Specifically, I focus on evidence for husbandry methods, continuity or disruption of specialization in production, processing, and provisioning, as well as shifts in food preferences. The analysis of archaeofaunal material from the northeast of Iberia provides an ideal laboratory for examining the ways in which food procurement adapted to changing economic and political environments as the region became increasingly connected with the wider Mediterranean world.

Tarleton, Matthew [197] see Powis, Terry

Tatem, Joy

[177]

Use-Wear Insight into the Chipped Stone Plant-Processing Tool Kit in the Lower Pecos Canyonlands

My current research is analyzing potential plant-processing chipped stone tools from several rockshelter and terrace sites in Eagle Nest Canyon within the Lower Pecos Canyonlands of southwest Texas excavated by Texas State University from 2013–2017. The

chipped stone tool assemblages evidence heavy plant polish on both informal and formal tools. Archaeological evidence and ethnographic accounts from the greater Southwest and Mexico show that sotol and agave lechuguilla were important plant resources, processed in intensive earth oven facilities and used as a major fiber resource. However the Lower Pecos lacks a formalized identification and analysis of the chipped stone tool assemblages associated with these plant-processing activities. Is there a correlation between informal or formal tool type and tool function? Were tool types used for singular or multiple activities? This poster will present a use-wear analysis of these plant-polished tools, analyzing wear patterns from experimental and archaeological assemblages in order to provide insight into the prehistoric chipped stone plant-processing tool kit.

Taube, Karl [225] see Coltman, Jeremy
Taube, Karl [164] see Houston, Stephen
Taube, Karl [138] see Hurst, Heather

Taylor, Christine [53] see Walling, Stanley

Taylor, Corinne (East Carolina University), Megan Perry (East Carolina University) and Robert Tykot (University of South Florida)
[80]

Reconstructing the Childhood Diet of an Eighteenth- to Nineteenth-Century North Carolina Land-Ownning Family

Breastfeeding and weaning practices can impact a child's immune system development and nutritional status and cause long-term health effects. Here we explore the potential relationship between the weaning process and childhood frailty in a late eighteenth and early nineteenth-century land-owning family in coastal North Carolina. The 10 individuals recovered from the Gause family cemetery in 2017 and 2018 include six children under the age of eight. Incremental $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ of dentin collagen of 13 teeth along with 10 bone samples provide a record of dietary and trophic level shifts that occurred during the weaning and post-weaning periods. The timing of weaning in addition to the composition of solid foods used to supplement breastmilk will be compared between subadult and adult individuals to identify whether particular childhood diets or weaning practices link with childhood mortality. These data are supplemented by macroscopic, radiographic, and histological evidence for metabolic deficiencies that may also impact childhood morbidity and mortality. Overall, this evidence will identify the weaning practices and dietary supplementation of "elite" land-owning families in the Lower Cape Fear region and their potential impact on population frailty.

Taylor, Ian and Alan Slade (University of Texas, Austin)
[198]

Early Paleoindian Fluted Points in London: Two Collections of North American Stone Tools Revisited in the British Museum

In reserve storage the British Museum holds two collections of North American stone tools. The Thomas C. Kelly collection of stone implements in the Department of Britain Europe and Prehistory contains a number of Clovis fluted points from the south and mid-west USA. The Department of Africa, Oceania, and the Americas holds a geographically and culturally wide-ranging collection of pre-contact archaeology acquired for the most part during the nineteenth century. Within these collections a number of Paleoindian artifacts, closely matching technological characteristics of Clovis points, were identified. This paper presents a brief history of the collections, the background of acquisition and a detailed analysis of the Clovis points. The authors believe that the current study of these collections outside North America is an important addition to the knowledge of Clovis fluted point occurrences, their distribution, and also provides scholars outside the United States the opportunity to research the collection.

Taylor, Kelley [129] see Schwartz, Christopher

Taylor, William (University of Colorado, Boulder), Isaac Hart (University of Utah), Julia Clark (Flinders University/NOMAD Science) and Jamsranjav Bayarsaikhan (National Museum of Mongolia)
[62]

Understanding Pastoral Prehistory and High Mountain Subsistence through Ice Patch Archaeology in the Mongolian Altai

In high latitude and high altitude environments around the globe, warming temperatures are melting previously permanent concentrations of alpine ice—revealing organic artifacts and ecofacts that provide newfound insights into human use of mountain regions. Although the Altai Mountains of western Mongolia appear to have played a key role in the transition from hunting to pastoral societies, the challenging geomorphological and climate conditions have left very little archaeological record with which to understand the region's prehistory. Ice patch archaeological survey conducted in 2019 reveals a rich archaeological record of human use of Altai mountain zones for both hunting and pastoral purposes—including household objects made of leather and horse hair as well as hunting tools and projectiles, sometimes exceedingly well preserved. Archaeological and biomolecular study of these objects reveals important choices in the selection of materials such as bone, antler, and sinew used for arrow construction, along with insights into the hunting strategies used by mountain occupants across several millennia of Altai prehistory. Archaeological results and interviews with area residents indicate that this rich archaeological record is urgently threatened by summer melting, with drastic impacts likely for both contemporary pastoralism and for the region's fragile archaeological record.

Taylor, William [119] see Bethke, Brandi

Tazza, Alejandra [260] see Muñoz, Lizette

Teeman, Diane [97] see Cowie, Sarah

Tegtmeyer, Caryn (Defense POW/MIA Accounting Agency)

[131]

A Moment of Mentorship, an Impact that Lasts a Lifetime

Mentorship may last but a moment in the grand scheme of things, but the impact a mentor has on a student can last a lifetime. Dr. Debra Martin has been a truly inspiring and committed mentor, both in terms of helping her students make their way through their degree programs, but also as they make their way into the world of professional anthropology. During my time as her student we collaborated on many research projects, including an examination of injury recidivism and homicide in Clark County, Nevada. Without her mentorship, my fundamental understanding of social violence would be lacking and the connections necessary to identify and understand patterns of violence within a community would not exist. I would not be able to see the patterns develop, or to understand the social complexities behind why these patterns exist. The research I present here takes these collaborations and applies them to my research on the bioarchaeological context of health, trauma, and injury recidivism at Canyons del Muerto and Canyon de Chelly. Deb's enthusiasm and love for anthropology is instilled in her students becoming a fundamental foundation to seeking out research, collaborating, and sharing research with the community at large.

Tellez, Joe [16] see Perez, Gary

Tembe, Enio [250] see Muianga, Décio

Temese, Seiuli [252] see Klenck, Joel

Tennie, Claudio [162] see Blessing, Matthias

Terry, Richard (Brigham Young University) and Daniel Bair (University of Puerto Rico, Mayagüez)

[163]

Soil Chemical Analysis of the Floors of Walled Enclosures within the Mirador Basin

Geochemical analyses of soils and floors have proven useful in the interpretation of ancient human activities. Lidar images of the Mirador basin have brought to light Preclassic walled enclosures in the Mirador basin. Soil chemical analysis in combination with lidar and excavation data helped determine the ancient uses for the enclosures. Extractable phosphorus and metallic ions were very low suggesting that the limestone bedrock floors were kept clean. The P and metals were elevated just inside the south and north walls of each enclosure. This is evidence that animals used those areas that might have provided some shade. The most likely animals to have been produced for ritual and food use were domestic dog.

Tessone, Augusto [61] see Reyes, Omar

Testolini, Veronica (University of Sheffield)

[196]

Decolonizing Islamic Archaeology in Sicily: Ceramic Innovation and Tradition in Palermo (Ninth–Eleventh Century AD)

Islamic archaeology in Sicily is deeply affected by culture history, with an antiquarian and colonial tradition focusing on the collection and study of objects, curated and appreciated largely upon aesthetic grounds. A linear and simplistic interpretation of the mobility of the new "Islamic" settlers in Sicily is generated, overlooking their interaction with the indigenous population and underestimating the myriad ways in which everyday life changed or remained the same on the island. A prime example is the dominance of analytical research into glazed pottery, seen as an "Islamic technology." Work on total ceramic assemblages of outlying rural sites have started to change this picture, but the city of Palermo, with its rich archaeological record, presents a greater challenge. As the capital of Islamic Sicily, it is taken to more closely represent social and political power structures. This paper represents an attempt to move away from simplistic cultural labels and maps of technological diffusion and demographic change, through the technological reconstruction of a ceramic assemblage from the capital of the new Islamic state. It discusses how best to reconstruct the everyday life of the colonizer and colonized, respecting the identity of the population and providing a range of archaeological insights.

Tew-Todd, Victoria (Baylor University), Connor Mayhack (Baylor University), Liliana Marin (Baylor University) and Steven Forman (Baylor University)

[8]

Late Quaternary Eolian Stratigraphy and Chronology by Thermal Transfer Luminescence Dating of Quartz Grains for the Monahans Eolian System

Monahans eolian system in west Texas is studied using 15 Geoprobe cores, >5 m long, which provides new stratigraphic records spanning ~1 mya. Stratigraphic modeling of this basin indicates that eolian sediment infills a fluvial landscape of the ancestral Pecos River. This area hosts Folsom sites within dune sequences, with occupation during wet periods when interdune lakes abound. The oldest part of the record > 100 ka was dated using thermal-transfer optically-stimulated luminescence (TT-OSL) protocols, yielding ages between 130 and 600 ka. The TT-OSL ages are compared with well-vetted single aliquot regeneration ages (SAR), which overlaps with the lower limits of TT-OSL, ~150–75 ka. The chronometric signal is 1%–2% of the corresponding SAR emissions,

yielding 1000s of photons; sufficient for dating. The TT-OSL emissions show sensitivity to solar resetting, with > 90% diminution of signal in 48 hr. OSL ages indicate that eolian accretion was modest or associated with mild pedogenesis 25–12 ka. Eolian activity occurred preferentially during interglacials, with pedogenesis and playa lake formation during glacials. Hydrologic excess persists in SW Texas with the Laurentide Ice Sheet at or near its southern limit, with the southward shift of Jet Stream circulation, particularly during Stage 6 and 8 glacials.

Thacker, Paul (Wake Forest University)

[36]

Cobbles that Complicate: Sourcing Studies and Secondary Lithic Raw Material Sources

Because of the relative ease of cobble extraction, prehistoric knappers in many regions of the world more extensively utilized secondary gravel deposits of chert and fine-grained lithic raw materials than corresponding parent geologic formations. Existing raw material sourcing research designs in archaeology, however, are poorly developed for integrating the significant variation in cobble morphology, texture, and geochemistry from complex gravel bed contexts. This poster presents the diverse methods used to systematically sample and characterize the famous Rio Maior-Azinhiera Ridge chert source in central Portugal. Greater than expected geochemical variation in RMAR cherts is dynamically related to diagenesis and weathering rather than original chert formation chemistry, and a single Upper Jurassic formation origin is falsified. Two prehistoric case studies illustrate the dramatic interpretive errors introduced by excluding this gravel raw material source from archaeological analysis. The RMAR project results demonstrate that nearest-source availability is the critical geographic variable for reconstructing anthropologically-valid models of prehistoric raw material economies.

Thacker, Paul [36] see Rubinatto Serrano, Juliana

Thaher, Ahmad [199] see Barket, Theresa

Thakar, Heather (Texas A&M University)

[237]

The Foraging to Farmer Transition: Generating Novel Testable Hypotheses

Around the world, localized differences in resource availability, environmental conditions, and technological capacities resulted in different rates and trajectories of cultural change associated with the transition to agriculture. In the Soconusco region of southern Mexico, Archaic-period foragers living continued to rely on resource-rich estuaries and wetlands, long after the initial introduction of productive plant domesticates, and even after the settlement of the earliest known villages. Building on expectations derived from evolutionary ecology, this paper generates a series of novel, testable hypotheses that interrogate the role of natural hazards, risk perception, and ecological resilience in the transition to agriculture.

Thakar, Heather [237] see Daniels, James

Thies-Sauder, Meagan (Illinois State University)

[114]

Discussant

Thimmig, Rachel (Southern Methodist University) and Kacy Hollenback (Southern Methodist University)

[119]

Rising from the Ashes: Post-smallpox Epidemic Changes in Pottery Firing Regimes on the Northern Plains

In communities recovering from disaster, especially those with high mortality rates such as epidemics, it is not uncommon for surviving craftspeople to modify certain dimensions of technological practice. These can include raw material selection, preparation, manufacturing technique, or intended use, this is because workloads for survivors often dramatically increase. A not yet studied attribute for pottery production is original firing temperature. Demand for fuel is driven by cooking, heating, and other needs, and requires labor time to be collected by individuals. It is hypothesized that we will see a reduction in original firing temperature as potters conserve wood for other purposes. To test this, we combined the techniques of step-wise clay oxidation analysis and magnetic susceptibility to analyze sherds from the Awatixa Hidatsa sites of Lower Hidatsa (32ME10), Sakakawea (32ME11), Taylor Bluff (32ME366), and Like-a-Fishhook (32ML2), in North Dakota. These sites pre and postdate the 1781–1782 and 1837–1838 smallpox epidemics, culminating in the last traditional earthlodge village on the plains.

Thomas, Jayne-Leigh (Indiana University), Rebecca Hawkins and Krystiana Krupa (Indiana University)

[49]

Giving False Voice: The Far-Reaching Impacts of Closeted Data and an Erroneous “Scientific” Narrative

Trust and transparency ideally should take precedent in NAGPRA matters between institutions and tribes. It is critical for institutions and their staff to ensure that scientific information presented about NAGPRA collections both before and after reburial is accurate and complete. This information is critical for tribes to have an understanding of science-based interpretations about their ancestors and may even guide reburial practices. It is just as critical for archaeologists, bioanthropologists, and other researchers who continue to rely on claims made about NAGPRA collections long after they are removed from further scholarly access. Both institutions and their researchers must also be clear about the scope and substance of consultation, and not claim official NAGPRA notifications and negotiations as scholarly collaboration with a tribe. This paper presents a recent NAGPRA repatriation project involving a collaboration between the Miami Tribe of Oklahoma and Indiana University as a vehicle to explore the impacts of data

held hostage, faulty analyses, and lapsed ethics on one tribe's reburial plans and protocols, on greater Indian history in the Ohio Valley, and on further uses of an erroneous "scientific" narrative.

[49]

Chair

Thomas-Oates, Jane [229] see Gaffney, Isabella

Thompsett, Neil, Sean Keef (Undergraduate Student), Dayle Bingham (Undergraduate Student) and Matthew Des Lauriers (Supervising Professor of Anthropology)

[66]

Paleo North American Consumption of Crustaceans: The Quantitative Measurement of Crustacean remains in Precontact Shell Middens

We here present the results of an analysis of crustacean remains excavated from Terminal Pleistocene age shell middens in Isla Cedros, Baja California, Mexico. While in its preliminary stages, this research consists of current analysis of the species discovered, as well as potential species which may have been used as either a food source or an early form of fishing bait. Among the most salient discoveries is what may be the oldest direct evidence for the human harvesting of lobsters in the Americas. This research not only has implications for understanding the human ecology of the initial migrants to the New World, but for fisheries management in the face of dramatic climate change and human interaction with unstable environmental systems.

Thompson, Amy (University of New Mexico), Luis Pacheco-Cobos (Universidad Veracruzana), Estrella Chévez (Posgrado en Ciencias de la Sostenibilidad, Univers) and Keith Prufer (University of New Mexico)

[29]

Social Network Analysis and Neighborhoods among the Classic Period Maya of Uxenká and Ix Kuku'il, Southern Belize

Studies of neighborhoods and districts are growing in popularity as they provide insight into the nuanced social relationships of the past. Archaeological sites with robust settlement data are ideal for reconstructing ancient neighborhoods and understanding smaller, intrasite community boundaries. Previously, geospatial analyses conducted on the settlement data from two Classic Period Maya (250–800 CE) centers, Uxenká and Ix Kuku'il, suggested the presence of neighborhoods and districts at both sites but resulted in different settlement structures. The application of a Social Network Analysis (SNA) can evaluate the connections between settlement groups using both material culture and spatial data, and therefore it can enhance our understanding of past communities and neighborhoods. In addition to spatial data, we analyze historic and material culture data, including several artifact classes and architectural characteristics, from 250 settlement groups to identify different social networks among the residents of Uxenká and Ix Kuku'il.

Thompson, Amy (University of New Mexico)

[155]

Moderator

Thompson, Amy [7] see Lemly, Marina

Thompson, Amy [26] see Ortman, Scott

Thompson, Ashleigh (University of Arizona)

[41]

Nishnaabewin, Storywork, and Ojibwe Theory: A Contribution to Ojibwe and Indigenous Archaeology

One aspect of archaeology that is not often discussed is theory and the theoretical frameworks archaeologists use to structure our research. In particular, Indigenous archaeology has been critiqued for not yet having completely defined theory. Yet, for those of us working in Indigenous archaeology, theory can be an important tool to "decolonize" our work. In engaging in research with my community, the Red Lake Ojibwe, using Indigenous theory has been a useful and significant part of my research process. By framing research questions, methods, and interpretations from an Ojibwe perspective, I was able to insert Ojibwe values, epistemology, and ontology into the research process, creating a relevant body of work for my community. Specifically, by building on work by other Anishinaabe scholars such as Sonya Atalay, Leanne Betasamosake Simpson, and Gerald Vizenor, as well as through the incorporation of Ojibwe storywork, I developed Ojibwe theory that has been useful in my research while also contributing to the growing body of Indigenous archaeological theory.

Thompson, Helen (University of Sheffield), Peter Day (University of Sheffield), Jaume Buxeda i Garrigós (Universitat de Barcelona), Gabriel Cocco (Àrea Arqueologia, Museo Etnográfico y Colonial "Ju) and Leticia Campagnolo (Àrea Arqueologia, Museo Etnográfico y Colonial "Ju)

[196]

Persistent Pottery Traditions: A Petrographic Study of Ceramics Found at Santa Fe la Vieja, Argentina (1573–1660)

Established by the Spanish on Indigenous land, Santa Fe la Vieja is located in the Rio de la Plata Basin, Argentina. Hosting a very diverse population, it has a correspondingly varied assemblage of ceramic material culture. The pottery includes indigenous wares, locally made colonial vessels, and foreign imports. These ceramics have been the subject of a detail macroscopic study followed by thin-section petrography to determine provenance and the production technology of the different wares. The analysis illuminates the material conditions of life in the colony, and the relationship between Indigenous and colonial groups at the site. The interconnection between cultural groups is evaluated from a primarily technological perspective, investigating raw material choice and manipulation, tempering traditions, forming methods and firing conditions. This relationship is further explored through provenance, with evidence of several samples found at Santa Fe la Vieja originating from the city of Mendoza, indicating colonial trade networks. The results

obtained build a strong case for persistent Indigenous pottery traditions, despite dominant colonial control. Overall, the analyses highlight a range of technological choices, trajectories of change, as well as aspects of subjugations and colonialism in the early modern period of Argentina through the study of ceramic material culture.

Thompson, Helen [196] see Iñáñez, Javier

Thompson, Ian

[43]

Discussant

Thompson, Jessica [38] see Radican, Kelsey

Thompson, Josie [163] see Ensley, Ross

Thompson, Kerry [184] see Ekdahl, Amanda

Thompson, Lauri (Center for Archaeological and Tropical Studies) and David Hyde (Western Colorado University)

[53]

Evidence for Ritual Use at Two Hinterland Shrines at the Medicinal Trail Community

Based on evidence from two Late-to-Terminal Classic ancestral shrines at the Medicinal Trail Hinterland Community in Northwestern Belize, this paper discusses the social context of ritual use within non-urban households. Structure A-4 from Group A and Structure B-1 from Group B have been identified as ancestral shrines. Both structures have numerous burials, are monumental in size, and are located on the eastern side of their respective group. The ritual behavior exhibited at these structures include obsidian blades for bloodletting and on the floor burning (Str. A-4). Rituals are embedded with meaning for those that perform and participate in them, and have both social and economic effects within the community. This paper will explore the types of rituals practiced at non-elite rural communities, and, using archaeological, ethnographic, and ethnohistoric data from the literature, speculate as the function and purpose of hinterland rituals.

Thompson, Lauri [53] see Drake, Stacy

Thompson, Lauri [178] see Godhardt, Ava

Thompson, Lenore

[71]

Museums as Repositories of Knowledge: Using Museum Collections to Study Colonial Impacts through the Changing Indigenous Use of Copper Metal in the Pacific Northwest

While museum assemblages must be examined with a critical eye acknowledging the colonial beginnings of many current collections, comprehensive and multifaceted studies that consider large study-areas, time depth, and multiple artifact types, are enabled and supported through conservation archaeologies. Additionally, museums can work to ensure ethical research practices by facilitating collaborative connections between researchers and Indigenous communities. The research discussed here focuses on the specific ways that Indigenous populations on the Northwest Coast used copper to create a range of artifacts, and the way in which traditional practices changed through the colonial period spanning from the eighteenth to twentieth century. Prior to contact Indigenous copper resources in the region were largely restricted to local sources such as drift and native metals. Examining the ways in which the metal was chosen and worked, and the objects created once European trade metal was introduced into Indigenous repertoires, allows for critical discussion around how Indigenous populations navigated this colonial period. This type of research requires the close physical examination and non-destructive chemical characterization of multiple types of objects created using copper, which is made possible through collaboration with museums around the world that have become repositories for historic, ethnographic, and archaeological material.

Thompson, Mary E. [76] see Slane, Brittany

Thompson, Thomas

[193]

Discussant

Thompson, Thomas and Jennifer Rovanpera (Bureau of Land Management)

[236]

Preliminary Results of the Energy Dispersive X-ray Fluorescence (EDXRF) ORA LLC Laboratory Project #190522: A Comparative Elemental Analysis of Volcanic Lithic Materials within the Tricorner Region of California and Nevada.

This presentation shall introduce the results of a preliminary geochemical analysis of unaltered, non-archaeological, bulk solid samples of volcanic lithic material (i.e., obsidian) utilizing a 'benchtop' model Energy Dispersive X-ray Fluorescence (EDXRF) spectroscopy device. The samples analyzed represent geographically discrete collections provided by the Bureau of Land Management Surprise Field Office and include thirty-four (34) different locations within eastern Siskiyou and western Modoc Counties

in California and northern Washoe County in Nevada. EDXRF analysis has become a more popular application for geological and archaeological research as the technology has become cheaper to purchase, more advanced and reliable with elemental detection, and faster in analysis processing time. This presentation will exhibit some of the first elemental analysis research conducted at the Open Range Archaeology LLC Laboratory in Norman, Oklahoma which recently acquired this equipment. With this preliminary research, I will discuss variance in the laboratory techniques implemented to streamline processing time and how this research compares with previous geochemical analysis in the 'Tricorner' Region of the Great Basin in northeastern California and northwestern Nevada.

Thompson, Thomas [193] see Beach, Sonya

Thompson, Victor [271] see Ardren, Traci
 Thompson, Victor [140] see Cochran, Lindsey
 Thompson, Victor [59] see Jorissen, Philippa
 Thompson, Victor [59] see Lulewicz, Isabelle
 Thompson, Victor [231] see Napora, Katharine

Thomsen, Tamara [192] see Galloway, Tori

Thornton, Erin (Washington State University), Kitty Emery (Florida Museum of Natural History), M. Charlotte Arnaud (French National Centre for Scientific Research) and Arianne Boileau (University of Florida)
[178]

Good Things Come in Small Packages: A Unique Maya Cache from La Joyanca (Petén, Guatemala)

Excavations at the Late Classic Maya site of La Joyanca (Petén, Guatemala) uncovered a cache of animal remains deposited within an interior construction phase of the site's western temple (6E12-sub). The faunal cache was interred along with a small piece of green stone in a shallow pit piercing a stucco floor in the structure's center room. Although faunal remains are common in Maya caches and burials, the Joyanca 6E12-sub cache is unique in its overall taxonomic diversity and emphasis on very small and/or sub-adult animals. The symbolic connotation of the cache's composition is considered through comparative ethnographic and archaeological evidence. The potential season of the cache's deposition, and the time it would have taken to collect the items found in cache are also inferred from the life history traits of the species found within this ritual context.

Thornton, Erin [129] see Fladeboe, Randee
 Thornton, Erin [233] see Fournier, Nichole
 Thornton, Erin [76] see McIntosh, Brandon
 Thornton, Erin [14] see Phillips, Lori

Throgmorton, Kellam (Crow Canyon Archaeological Center) and Susan Ryan (Crow Canyon Archaeological Center)
[149]

Preliminary Results from the Northern Chaco Outliers Project

In 2017, Crow Canyon Archaeological Center (CCAC) began excavations at the Haynie Site (5MT1905), in Southwestern Colorado. The site contains two Chaco-era (1080–1140 CE) great houses that are part of the larger Lakeview group (which includes two other great house sites). The Chaco-era structures sit atop a large, earlier aggregated settlement. Investigations by CCAC have focused on the western portion of this settlement, which include extensive ninth, tenth, and early-eleventh century deposits in addition to the remains of the western great house. This poster presents preliminary results on the architecture, stratigraphy, and material culture analyses from three years of excavation efforts in that area.

Thulman, David (George Washington University)
[17]

Using Geometric Morphometrics to Identify Prehistoric "Territories"

The distribution of subtle variation in the haft shapes of Early Archaic notched points reveals the spatial distribution of likely territories during the earliest Holocene epoch in northern Mississippi and along the Tennessee River. By analyzing hundreds of points from this region, we can get some sense of the scope of regular information exchange and interaction among groups of point makers and where major breaks in interaction lay. Shape-analyses allow us to move beyond more traditional territorial inferences based on raw material use.

Tiesler, Vera (Universidad Autónoma de Yucatán) and Virginia Miller (University of Illinois, Chicago)
[225]

Heads, Skulls, and Sacred Racks: New Studies on Ritual Body Processing in Chichen Itza and Beyond

Chichen Itza stands as a monumental landmark of late Maya religious complexes. Among the enigmatic aspects of Chichén's ceremonial innovations count skull racks, where the heads of sacrificed victims were exhibited in rows. It was the first Mesoamerican city to erect a permanent, decorated stone platform for the display of impaled heads, anticipating common Late Postclassic practice. Here we explore skulls with marks of impalement and mandibles with perimortem trauma from both the Sacred Cenote and the Caracol complex, as well as images of skulls and bones. Our combined skeletal and iconographic data confirm increased head processing and exhibition at Chichén when compared to Classic-period Maya centers. Nevertheless, these were not foreign introductions, but appear to have been practiced earlier on a minor scale at Terminal Classic Puuc centers. We posit that the

exhibition of heads at these sites was a response to the religious and militaristic demands of a new era, culminating in Chichen Itza's dramatic public displays.

[225]

Chair

Tiesler, Vera [173] see Nakatsuka, Nathan

Tiesler, Vera [225] see Olivier, Guilhem

Tiesler, Vera [225] see Ruiz, Judith

Tilden, Douglas [158] see Watkins, Tia

Tillison, Kevin (University College Dublin)

[85]

Life and Death of Wooden Vessels: Understanding Woodcraft in Early Medieval Ireland, AD 400–1100

This project investigates early medieval Irish woodcraft (AD 400–1100) to ask the questions: what is craft and what makes a craftsman? Over the past few decades numerous wooden items have been recovered from this period in Ireland, thus providing an opportunity to gain an insight into the crafts represented and draw out the related themes of skill, specialization and status. Interpretations relating to woodcraft are based on 1,607 wooden artifacts collated during this project, sourced from past archaeological investigations of rural secular sites from across Ireland. These objects were mostly recovered from wet anaerobic conditions that allowed for the preservation of organic materials. Specific focus has been given to wooden vessels (e.g., buckets, kegs and bowls) of different manufacturing technologies (i.e., stave-built, carved and turned) which highlighted differences in material selection and skills required to make these objects; even within the same manufacturing technology. This focus allowed for the question to be asked, what is craft, but also to what extent can the material remains recovered provide a clearer perspective on the relationship between the production of wooden objects, the people who made them and the society within which they worked.

Tincu, Sorin [159] see Turcanu-Carutiu, Daniela

Ting, Carmen [128] see Zralka, Jaroslav

Ting, Kathryn

[213]

Container Glass Analysis: Reconstructing African American Lifeways at the Stephen and Harriet Meyers Site in Albany, NY

In 2017, a UAlbany Team excavated the Stephen and Harriet Meyers site unearthing 629 container glass fragments in a cistern, a sealed feature with concentrated refuse. Comparing glass fragments found in lower levels and upper levels exhibits changes in the residents' lifeways throughout time. This study explores prior research by Corey McQuinn, into African American social identity, affirming status signaling as a mechanism to oppose to racial injustice. This is significant because not many studies have been done on the lives of urban, middle class African Americans in the Northeastern United States. John Johnson and Stephen and Harriet Meyers occupied the house from the 1840–1850's. This residence headquartered "The Vigilance Committee" and helped slaves to freedom along the Underground Railroad. In my analysis, I determined these patterns. 1) Twenty different types of glass were found- fifteen were container glass fragments, the rest were other objects. 2) Twelve colors of glass were present, including the most abundant—clear glass. 3) More diversity of glass colors was present in Levels 2 and 3, indicating their access to other colors increased. 4) Level 1 shows a decrease of glass found, suggesting glass use was diminishing. The excavation and research are ongoing.

Tippin, Gary [254] see Bradley, Benjamin

Tizzard, Louise (Wessex Archaeology) and Claire Mellett (Wessex Archaeology)

[238]

Across and beyond Site Boundaries: Maximizing the Legacy of Submerged Landscape Assessments

The last 15 years have seen a massive increase in offshore development around the UK, which has provided archaeologists the opportunity to find and examine new sites from areas of seafloor, in deeper waters and further from the coastline than was previously possible. Through the interpretation of geophysical and geotechnical data within development areas, collaboration between archaeologists, geologists, engineers and other stakeholders has significantly advanced our understanding of preservation of inundated landscapes over large areas. However, the data and their associated reports, when available, are site-specific and although has significant value for wider research seeking to understand the potential of "Doggerland," this value is not necessarily realized on a regional and national scale. Using a case study, this paper will demonstrate how the value of site-specific data can be increased by (a) considering landscapes across and beyond their site boundaries, enabling the formulation of area-specific research questions; (b) using these research questions to inform site-specific aims and objectives rather than simply reacting to data availability; (c) utilizing all available data, including that collected for non-archaeological purposes, and; (d) promoting wider engagement beyond the archaeological community.

Tizzard, Louise [238] see Evans, Amanda

Todd, Lawrence (GRSLE) and Arthur Middleton (University of California Berkeley)**[75]***Investigating the Long-Term Fidelity of Ungulates to Migration Corridors: Applied Landscape Archaeology in the Greater Yellowstone Ecosystem, NW Wyoming*

The recent revolution in GPS tracking technology has increased wildlife ecologists' understanding of long-distance ungulate migrations. Multi-year studies indicate that ungulates are relatively faithful to migration corridors and seasonal ranges. However, ungulates' longer-term fidelity to these pathways (i.e., century to millennial scale) is difficult to assess and remains generally unknown. While regional Holocene faunal assemblages are relatively rich in bones of species such as bison and bighorn sheep, which provide opportunities for isotopic or trace element analyses to gain insights into general movement patterns, the few assemblages with abundant elk remains provide only limited samples for such analyses. We conducted archaeological inventories along corridor segments used by one of the Greater Yellowstone Ecosystem's largest present-day elk herds, including spatial data on artifact types, lithic raw material source areas, temporally diagnostic artifacts, and hunting-related feature locations. Corridor segments often have higher-than-normal projectile point and hunting features densities than adjacent areas, suggesting humans may have made regular use of the corridors either for travel or intercept hunting. Yet we also documented a segment with little or no associated archaeological material. Such differences in archaeological evidence may help discern whether some corridor segments have received long-term use, and others were adopted more recently.

Todd, Lawrence [249] see Kappelman, John

Todd, Lawrence [65] see Neff, Matthew

Todd, Lawrence [236] see Rapes, John

Toffolo, Michael [162] see Bousman, Britt

Toftgaard, Casper [212] see Harvey, Virginia

Tokovinine, Alexandre (University of Alabama)**[54]***Discussant***Tokovinine, Alexandre (University of Alabama)****[265]***So Say the Gods: What Classic Maya Tell and Do Not Tell about War*

Even though the literal translation of nearly every war-related expression in Classic Maya inscriptions has been known for decades, the significance of textual and visual representations of warfare remain a highly contested domain of Maya studies. Scholarly views on the subject are still guided by old assumptions and stereotypes refitted to various current theoretical frameworks. Yet new archaeological and paleoenvironmental findings call for a reevaluation of epigraphic and iconographic sources. This paper offers a survey of the available evidence to propose an updated interpretation of warfare causes, military organization, combat tactics, and aftermaths of war-related violence. It cautions against an epistemic trap of preferring some precontact and contact period sources as more reliable representations of warfare. Finally, it highlights changes in Classic Maya warfare practices as seen through the lens of hieroglyphic inscriptions.

Tokovinine, Alexandre [223] see Viskanta Khokhriakova, Sandra

Tolan, Grace, Claire Rebbe (Rhodes College), Jera Davis (New South Associates, Inc), Stephen Carmody (Troy University) and Jon Russ (Rhodes College)**[63]***GC-MS Analyses of Smoking Pipe Residues from Moundville (1TU500)*

Chemical residue analysis of archaeological artifacts has become an asset for understanding prehistoric human activities. The presence of particular compounds (biomarkers) or suites of compounds provides direct evidence for specific resources exploited in the past. Here we report on chemical analyses of residues from smoking pipes recovered from the Moundville site (1TU500), a large Mississippian site located in west-central Alabama. First settled in ~ AD 1120, over the next 80 years, domestic settlement sprawled out across the landform and around several small mounds. In AD 1200, major modifications of existing mounds was followed by the construction of the mound-and-plaza complex observed today. Population in the region centered at the site for the next 150 years and landscape modifications correspond to changes in Moundville's sociopolitical hierarchy and religious organizations. Because pipes were being made and used during every phase of Moundville history, compounds in pipe residues might also reflect these changes. We used GC-MS to identify the presence of nicotine, a biomarker for tobacco. We also analyzed various plants, both in raw form and after being smoked, to determine whether distinct biomarkers are present that could allow the identification of plants other than tobacco in the smoking complex.

Tolan, Grace [215] see Fields, Mara

Tolmie, Clare (Illinois State Archaeological Survey)**[213]***Over There Over Here: A WWI Landscape in Northern Illinois*

Established in April 1917, the military cantonment at Camp Grant, located south of Rockford, Illinois was one of the largest WWI

training camps in the United States. Maximum strength during WWI included 1,689 officers and 48,854 enlisted personnel; over 1,000 administrative, residential, training, and support facilities; the Bell Bowl; a drill field; concrete tent platforms; a hospital; and prisoners of war (POW) compound. Training included rifle drills, combat techniques and gunnery. An important aspect was trench warfare. By 1917, trench warfare was well-established on the Western Front and U.S. troops required training and familiarization with both trench construction techniques and trench layouts. As a result, an extensive network of trenches, replicating the trenches in use in France and Belgium, developed in the eastern area of Camp Grant. This poster reports on archival research and remote sensing undertaken to reconstruct the trench system at Camp Grant and identify areas where these features may still survive in the modern landscape.

Tomazic, Iride (University of Michigan)

[34]

Sick in the Swamp: Societal Relations and Disease in the Middle Copper Age Cemetery of Podlokanj Nove Bašte, Serbia

Historical records report numerous ways in which societies dealt with disease in the past. Diseases with visible symptoms, such as plague or malaria are obvious, while others, such as the vast majority of metabolic diseases, are often much less visible. This poster aims to explore the connection between disease and social relations in a Copper Age society via an analysis of the Podlokanj Nove bašte cemetery in Northern Serbia. Prior to drainage in the nineteenth century, the area existed as a vast marsh. These frequently flooded areas constituted a challenging living environment in terms of subsistence, settlement, and resources procurement. The region was also fertile ground for disease and environmental contaminants. Through an analysis of skeletal pathologies and funerary treatment, this poster will explore social differentiation during the Middle Copper Age and examine how societal relations were affected by life, death, and disease in the marshy lowlands of the Southern Carpathian Basin.

Tomczyk, Weronika (Stanford University) and Nathan Acebo (Stanford University)

[27]

In a Shade of Colonial Expansion: The Subsistence Strategies and Consumption Practices in Black Star Canyon, Southern California

Puhu(CA-Ora-132), a Native American settlement located in the Santa Ana mountains of California, has been remembered as a unique place of conflict centered around animal utilization. In 1831, Puhu was attacked and defeated by American fur trappers after the accusations of horse-thieving for food. However, analysis of animal remains from Puhu's excavations revealed that European livestock had a minimal, if not a nonexistent impact on the village's subsistence strategy. The assemblages from the Late Prehistoric (1300–1770 CE) and Colonial period (1770–1850) were dominated by local species, mainly deer (*Odocoileus hemionus*) and lagomorphs (*Lepus californicus*, *Sylvilagus*). Their remains include preserved as well as fragmented and burned bones, which indicate elaborated food processing practices, and subsequent use of remains as fuel. We suggest that the deer were easily accessible for the Puhu's inhabitants, because of coastal colonization and the introduction of European-style agriculture which caused inland migration of game herds. Furthermore, scarce remains of felines (*Puma concolor*, *Lynx rufus*) and mustelids (f. *Mephitidae*) suggest taking advantage of other indigenous species. Although our findings do not preclude the occurrence of small acts of thievery, the village's subsistence did not depend on it, but rather thrived based on the continuous exploitation of local game.

Tomich, Kassi (Idaho State University), Alexandra Williams (Idaho State University) and Amy Commendador (Idaho Museum of Natural History)

[177]

Changes in Small Mammal Mandible Morphology with Environmental Fluctuations over the Holocene Period in the Snake River Plain, Southeastern Idaho

Previous research suggests that the chemical composition of bone from small mammals recovered from owl pellets tracks environmental fluctuations over long periods of time. While these data are valuable, they do not inform on how these changes might have directly affected the animals themselves. Here we compare morphological measurements and chemical analyses from an assemblage spanning the last 10,000 years in southeastern Idaho to evaluate physical responses of these animals to environmental perturbations. Morphological analyses focused on mandible diastemal and tooth row length for three species: Northern Pocket Gophers, Pygmy Rabbits and Townsend's Ground Squirrels. The diastemal length is an indicator for body size, found to vary with environmental conditions in gophers, while tooth row length is genetically linked, potentially informing on turnover in animal populations over time. Chemical data consist of carbon ($\delta^{13}\text{C}$) and nitrogen ($\delta^{15}\text{N}$) isotopes obtained from specimens in the same levels. Preliminary results show some correspondence in trends between the morphological and chemical datasets, indicating these species were experiencing body size changes in accordance with larger environmental fluctuations. There is no clear evidence of population turnover, but variation is lower in tooth row length, as expected if this morphological parameter is genetically linked.

Toney, Elizabeth [77] see Morgan, Robert

Toney, Joshua

[188]

Chair

Toney, Joshua [188] see Stephen, Jesse

Toohy, Jason (University of Wyoming) and Patricia Chirinos Ogata (University of California, Santa Barbara)**[106]**

A Cajamarca Basin Perspective on Northern Highland Interaction during the Middle Horizon and Late Intermediate Periods
Investigations at the Cajamarca sites of Callacpuma and Yanaorco are shedding new light on shifting patterns and intensities of interregional interaction. Highland influence on the coast has been recognized for many years in the coastal Jequetepeque region and the valleys to its north. The current work presents intriguing new material evidence for the presence of coastal material culture in sites of the Cajamarca Basin indicating at least some level of contact during both the early Middle Horizon and the Late Intermediate Period. This material takes the form of both everyday utilitarian objects and more enigmatic ceramic vessels and figurines. All of this indicates previously unexpected levels of material contact with the north coast and hints at social and political interaction between the two regions.

Toohy, Jason [243] see Stagg, Sarah

Toomey, Rickard (National Park Service—Mammoth Cave National Park) and Ernest Lundelius (University of Texas, Austin)**[19]***Vertebrate Paleontology of Hall's Cave*

Excavations at Hall's Cave from 1986 through 1994 established that the site contained a well-stratified deposit at least 3.7 m thick which spanned at least the last 18–20,000 years. Vertebrate material is abundant throughout the sequence and provides an unparalleled view of the evolution of the vertebrate community and environment of central Texas since the last glacial maximum. At least 62 mammal and 48 non-mammal species were identified from analysis of the bone from the deposit, these include at least 12 extinct and 22 extralimital taxa. Recent aDNA studies have increased this diversity. Several taphonomic pathways were important in deposition of bone including owl pellets, bone washing in, animals living in the cave, and animals dragging prey into the site. Changes in species and their abundances in the deposit over time provides important information on climate and environmental change in the area from the Last Glacial Maximum through the Post-glacial. This includes good resolution during the Younger Dryas, which provides a view of this event from lower mid-latitude. Notable changes documented include significant warming and drying, large decreases in the depth of soil, changes between savanna and grassland, extinctions, and breakup of non-analogous faunas.

Torquato, Melissa, John Rapes (Purdue University), Ben Schiery (Purdue University) and Erik Otárola-Castillo (Purdue University)**[176]***The Effects of Regional Climate Change on the Foraging-Farming Transition in Eastern North America*

For a century, scholars studying prehistoric subsistence have questioned why humans began farming. A common hypothesis is that climate change contributed to the emergence of agriculture. One area where climate change may have influenced early agriculture is the Interior Eastern Woodlands of North America, where the independent domestication of native plants occurred during the Late Archaic period (4500–4000 BP). However, there has been little quantitative analyses examining the effects of climate change on the foraging-farming transition in North America. Our previous research suggests that climate change influenced subsistence behavior during the transition period. The present study expands on prior work by increasing the sample of archaeological sites to provide a more complete representation of the region. This project tests the hypotheses that climate change (1) preceded the foraging-farming transition and (2) led to the increased use of cultivated resources in the prehistoric diet. To test these hypotheses, this study utilizes paleoenvironmental proxies and reconstructions to examine regional climatic trends and archaeological data to evaluate dietary changes during the transition period. This analysis will advance the study of prehistoric subsistence strategies by demonstrating how intra-regional climate change affected the development of agriculture and the use of cultivated resources in North America.

Torres, Jimena [177] see San Román, Manuel

Torres, Lourdes [257] see Ordoñez, Maria

Torres Morales, Genesis and Celeste Gagnon (Wagner College)**[169]***Exploring Stress and Diet: A Bioarchaeological Understanding of the Chimú at Huaca de la Luna*

The Chimú (AD 900–1470) were the second largest Andean empire. Emerging in the Moche Valley of Peru, the Chimú extended their reach from the northern border of Ecuador, south to the Chillón valley of Peru. They built their capital Chan Chan on an empty beach near modern day Trujillo, however, the Chimú also interacted with the previously abandoned capital of the Southern Moche State- the Huacas de Moche. The Chimú remodeled the religious center of the site, and interred their dead in pre-existing platforms at Huaca de la Luna, and scattered throughout the urban sector. This research presents preliminary findings of 32 burials excavated from Huaca de la Luna or the urban center. The objective of this presentation is to begin a conversation about the Chimú from a bioarchaeology perspective. We analyzed cribra orbitalia, porotic hyperostosis, periosteal, and linear enamel hypoplasia to chart stress. Caries, abscess, antemortem tooth loss, wear, and periodontal disease was analyzed in order to reconstruct diet.

Torres Porras, Alicia, Patricia Plunket Nagoda and Gabriela Uruñuela Ladrón de Guevara**[119]***Explorando la Transición del Posclásico a la Colonia en Cholula, Puebla: 1519–1540*

La llegada de los hispanos a la ciudad sagrada de Cholula, donde peregrinos y gobernantes se congregaban para rendir homenaje

a Quetzalcoátl en su recinto ceremonial, trajo consigo grandes cambios debido a la literal cimentación del catolicismo sobre dicho recinto. Para tener un acercamiento acotado a patrones de uso y consumo en una época de transición, se comparan materiales relacionados con la destrucción del complejo prehispánico y los procedentes de los depósitos de la ocupación española inicial, posiblemente correspondientes a la construcción del primigenio convento franciscano de San Gabriel. Este estudio examina una pequeña muestra de cerámica, lítica y restos óseos, tanto humanos como faunísticos, recuperada en 1993, justo afuera del convento, y sugiere que las principales diferencias producto de la presencia española se aprecian en la dieta y el tratamiento de los restos humanos.

Torvinen, Andrea (Arizona State University) and Matt Peeples (Arizona State University)

[123]

A Monte Carlo Approach to Estimating Plausible Ceramic Similarity Values from Fabric Characterizations

Ceramic characterization studies often depend on estimates of similarities and differences in assemblages drawn from relatively small samples to address questions regarding a range of social patterns and processes. In most cases, such characterizations do not consider uncertainty due to sampling error nor do they consider in detail the relationship between characterized samples and whole assemblages. We introduce a method that allows ceramicists to extrapolate plausible values and ranges for ceramic diversity and similarity values between contexts based on limited observed data (i.e., petrographic fabrics or chemical reference groups) using a Monte Carlo simulation. We use this method to evaluate the spatiotemporal consistency of ceramic production among potters at the West Mexican center of La Quemada, Zacatecas. Our study relies on a relatively small petrographic sample of 297 sherds (2.86% of site assemblage) belonging to 19 pottery types, each having been assigned to one of four fabric classes. Using these data with site-wide ceramic frequency data, we generate estimates and error ranges of the plausible similarities between contexts across the site in terms of shared fabrics that crosscut ceramic types. We suggest that this methodology has wide-reaching applications at various spatial scales and using different types of characterization data.

Toussaint, Mark (University of Nevada Las Vegas)

[131]

Queer Eye for the Dead Guy: The Influence of Debra Martin on a Bioarchaeological Investigation of Gender beyond the Binary

Any aspect of human social life worth studying, whether in the past or present, is a complex product of history, biology, culture, and agency. Gender is a prime and important example of just such a topic. It requires a high degree of nuance to understand and describe gender constructs in a contemporary society, and studies of gender in prehistory are even more fraught. This presentation will focus on what can be learned of gender in Early Bronze Age (EBA; ~2300–1600 BCE) communities of Central Europe through theoretically informed bioarchaeological studies. The unmistakable influence of Dr. Debra Martin will be readily apparent in the biocultural and contextual approach to this research, which draws heavily from embodiment theory and from paleoepidemiological models of the recursive relationships between stressors (environmental and cultural), buffering mechanisms, and health outcomes. This holistic and multiscale orientation toward bioarchaeological research, championed by Dr. Martin, has enabled the current study to find evidence of a complex, plastic, and perhaps non-binary system of gender in EBA Mierzanowice Culture communities of southern Poland.

Trabanino, Felipe [211] see Johnson, Lisa

Trachman, Rissa (Elon University), Jacob Canterbury (Texas A&M University) and Daniel Conley (University of Kentucky)

[53]

The Essentiality of Ancient Maya Ritual to the Economic and Social: Evidence from the Site of Dos Hombres, Belize

Ritual expression was by its very nature an integral part of everyday ancient Maya society. Ritual structured many aspects of daily life. At the site of Dos Hombres in northwestern Belize, evidence is presented from multiple contexts for the manifestation of ritual expression as it is necessarily tied to economic activity and social life. Ongoing research in the form of architectural and non-architectural excavations, isotope data, and lidar has been focused in the northern plaza, a space of public activity. From these recently collected data, in combination with previously excavated data in the 1990's, an evocative picture emerges. Classic Period material culture associated with burials, tombs, a non-architectural possible market locale, and a large deposit found inside a monumental structure highlight the interwoven nature of ritual with economic production, social activity, and commerce.

[53]

Chair

Trachman, Rissa [233] see Canterbury, Jacob

Trachman, Rissa [53] see Valdez, Fred, Jr.

Tran, Tara [77] see Cromwell, RP

Trapani, Paolino [104] see Kingsland, Kaitlyn

Traslaviña, Abel (Vanderbilt University)

[224]

Negotiating Land and Water: Exploring the Inka Strategies of Natural Resource Management in the Lurin Valley, Central Coast of Peru

The central coastal region of Peru is an area with great ceremonial centers and massive anthropogenic landscape modifications. Over thousands of years of human occupation, this region has been transformed by the use of two vital resources: land and water. The control of both resources has been and continues to be a strategic issue among human groups in this area at the economic, social, political, and ceremonial levels. By integrating archaeological and documentary data, this paper examines the changes in the social and political landscape that occurred with the Inka arrival in the lower and mid-Lurin Valley, centering the analysis in the materialization of the imperial strategies to manage and use such crucial natural resources.

Tremayne, Andrew [64] see Junge, Justin

Triadan, Daniela (University of Arizona)

[93]

Discussant

Triadan, Daniela (University of Arizona)

[126]

Changes in Ceramic Production and Distribution at Ceibal, Guatemala

Ceibal was occupied from about 1000 BC until around AD 950. Our work there has resulted in a new fine-grained chronology that allows us to trace changes in ceramic production through time at an unprecedented resolution. Based on this chronology instrumental neutron activation analysis and petrography of ceramics from all time periods of the site show that throughout its occupation the majority of ceramics found at Ceibal were locally produced and consumed, but paste recipes changed through time. The analyses also indicate that in some cases clays were specifically selected to produce certain types of ceramics and that the exploitation of these sources changed through time. Throughout Ceibal's history only small numbers of ceramics were imported. Interestingly, the areas from which those ceramics came shifted through time, indicating changes in interactions. In general, the patterns seem remarkably consistent through time and persisted into the Late and Terminal Classic. They suggest that while by the Late Middle Preclassic ideas about ceramics were widely shared throughout the Maya lowlands, actual pots were not exchanged in large numbers.

Tribolo, Chantel [162] see Bousman, Britt

Trigg, Heather (Univ Massachusetts Boston)

[125]

Challenges of Colonizing a Marginal Environment: Risk and Failure in Early Colonial New Mexico

The American Southwest is a landscape that is marginal for agriculture, and the Pueblos, indigenous agriculturalists who inhabited the region, have developed many ways of buffering risk. In 1598, the Spanish began the colony of New Mexico. Over the previous 60 years, there had been several exploratory expeditions into the region, but for most Spanish colonists, this was their first foray into the lands north of the Rio Grande. On an individual basis, they set up households in a novel, unknown land, but as a group, Spanish colonists had practices, established through years of colonialism, that encouraged successful establishment of colonies. Some of these practices structured the ways colonists engaged the environment in their agricultural pursuits; others consisted of social relationships among colonists and between colonists and indigenous people. In this paper, I explore the ways in which seventeenth-century colonists in New Mexico buffered risk in this challenging landscape. It is important to recognize that while these ways of making due helped to establish the colony, colonists were not entirely successful, and failures to manage risk may have contributed to the Pueblo Revolt and the temporary abandonment of the colony.

Trigg, Heather [112] see Albert, Katherine

Trimble, Michael (U.S. Army Corps of Engineers)

[132]

Discussant

Trimmis, Konstantinos [36] see Kardulias, Paul Nick

Trinidad-Rivera, Gelenia (University of Puerto Rico, Río Piedras Campus)

[192]

Apprehend the Flawed! Social Disability in the Newspaper La Gaceta del Gobierno de Puerto Rico Advertisements, 1831–1833

Slavery in Puerto Rico had its various levels of abundance and scarcity during the nineteenth century. With the establishment of open trade regulations and the continuous efforts of Spain to retain its imperialist status, chained enslaved African and 'mulato' populations on the island were kept as the fuel for the wealthy. If it was difficult for those who were enslaved to survive during this period, those who had visual "defects" that stayed away from the norm of the time, suffered the worst consequences. The following study focuses on analyzing, under the lens of social disability, the populations of enslaved individuals who presented corporal indicators of their social status such as wounds, amputations, tattoos, scars, and scarifications, among others. The historical rescue presented in the following investigation is carried out by consulting advertisements and announcements from the newspaper "La Gaceta del Gobierno de Puerto Rico", during 1831–1833, related to the sale and marketing of fugitives and captured enslaved individuals. From the data retrieved, the aspects related to race, sex, and age are correlated. Thus, illuminating inside the darkness

where these populations are constantly nudged: the periphery of history's official narrative.

Triplett, Taylor (The College of William and Mary)

[251]

The Hand Site Reassessment Project: Gleaning New Perspectives from Reposited Collections

This paper reviews the ongoing Hand Site (44SN22) Reassessment Project, and broadly explores the reevaluation of existing collections as an avenue for decolonization. The Hand site is a complex, multi-component site located on the Nottoway River in southeastern Virginia. Intensive excavations in the 1960's revealed over 600 features, including house remains, pits, and a large cemetery. Initial evaluation placed the site within the proto-historic period (1580–1630). However, recent reexaminations of the Hand site archaeological collection have dramatically expanded the site's known temporal breadth. Situated at the liminal frontier of the Chesapeake and Albemarle worlds, the Hand site provides a critical lens for examining the deep history of ancestral Nottoway, Meherrin, and Nansemond—peoples at the fringe of seventeenth century colonial accounts

Tritsch, Michael (Johns Hopkins University)

[263]

The Encroachment of Domestic Religion at Karnak: Preliminary Interpretation of Findings in the Precinct to the Temple of Mut

This paper explores an excavation site in the rear of the Precinct to the Temple of Mut, outside the Eighteenth Dynasty enclosure wall, providing new insight into domestic life and religion prior to the Amarna period. The findings of interest involve sandstone pavers and a collapsed lintel with cavetto cornice and torus roll, surrounded by collapsed painted mud brick, primarily red. The latter may be related to architectural features, mainly jambs. The majority of the pottery recovered in situ dates to the first half of the Eighteenth Dynasty, but this area had been cleared in 2005 when other pottery, identified as Ramesside, was reportedly found. From a thorough literature review of other New Kingdom domestic sites, this context shares significant similarities to the "divan room" in Deir el-Medina houses or the "central room" in Amarna houses. The sandstone feature bears a striking likeness to a divan and the painted mud brick is consistent with a niche shrine commonly found in these rooms. At both sites, the color red appears almost exclusively on door frames and niches. Photogrammetric analysis of objects from similar contexts at European museums has also been performed to aid in the interpretive process of this unique find.

Troccoli, Ruth (D.C. City Archaeologist) and Christine Ames (Assistant City Archaeologist)

[193]

Gold Is in the Eye of the Beholder: Public Outreach and Education in Washington, DC

Archaeological review and compliance in Washington, DC is handled by the DC Historic Preservation Office, a unique hybrid that operates as a local city/county agency as well as the SHPO. Typically, the DC HPO Archaeology team does not conduct compliance activities, but we do employ federal and local compliance mandates to require—nudge, coax, cajole, and wheedle—federal and local agencies to include public outreach and education elements in mitigation plans. We are especially pushy about projects on District-owned property and push for consultants to give presentations to the public at local venues, and to develop educational materials. We also encourage consulting firms to participate in outreach events or to volunteer with us. Creating effective outreach activities and developing a cadre of volunteers to help present them to the public takes time and effort. We observed a hunger for neighborhood-level historical and archaeological information (stories) that create a sense of place for new residents, and that demonstrate deep-seated ties of the extant community. In a highly educated city with deep levels of income disparity and gentrification pressure, we find that the gold standard is the good will and sense of community we generate through public outreach.

Troendle, Kimberly (University of Wyoming)

[65]

Can We Move Past the Nomenclature? Test of a Dichotomous Key for Typing Projectile Points in Wyoming

Projectile points are commonly used as temporal markers in lieu of radiocarbon dates. However, for many locations there are multiple established point typologies resulting in debate about which typology should be used. Frequently there are multiple seemingly appropriate typologies to choose from, but none that were made for the specific region. This begs the question, what is the affective range of a typology? Recognizing the variability in projectile point typologies Reckin and Todd (2019, *Plains Anthropologist*, p.1–29) created a dichotomous key for typing projectile points in the Greater Yellowstone Ecosystem. This typology relies on metric and non-metric measures of projectile point hafting elements. I test their typology against collections of points from well dated Archaic and Late Prehistoric kill sites from across the state of Wyoming to determine the applicability of the typology outside of the region it was created in. This research investigates the geographic limitations of typologies and tests the effectiveness of a quantitative measurement system for dating points compared to a purely on qualitative system as is the case for most regional typologies.

Trombetta, Lindsey [249] see Kappelman, John

Troncoso, Andres [243] see Alfonso-Durruty, Marta

Troncoso, Andres [224] see Murphy, Beau

Trousdale, William [205] see Allen, Mitchell

Trubitt, Mary Beth (Arkansas Archeological Survey), George Sabo III (Arkansas Archeological Survey) and Teka McGlothlin (Arkansas Archeological Survey)

[166]

Tracing Human and Animal Imagery through Caddo Effigy Vessels, Stories, and Dance

Human figures and animals such as ducks, turtles, frogs, fish, and bears were occasionally depicted on pottery in the Caddo area in Arkansas, Louisiana, Texas, and Oklahoma in the Mississippian period (AD 1000–1700), but less often than in the Mississippi River Valley further east. Representational imagery on effigy pottery (and, very rarely, wooden vessels) from archaeological sites in the Caddo area is one path to iconographic analysis. Another route examines more abstracted designs on ceramics and other media. New documentation technology such as 3D scanning augments iconographic research and provides access to collections. Interpretations of these objects and their uses and meanings in the past can also benefit from ethnohistoric descriptions of Caddo communities, ceremonies, and stories by outsiders (Spanish and French in the late 1600s–early 1700s, non-native anthropologists in the early 1900s), as well as from traditional dances—such as the Bear Dance, Duck Dance, Turkey Dance, Fish Dance—still performed by Caddo Indians in the present day.

Trusler, Kate (University of Missouri), Jessica Bernstetter (University of Missouri), Wayne Lorenz (Wright Paleohydrological Institute) and G. Martin-Apostolatos (University of Missouri)

[159]

Around the Neighboring Watering Hole: Comparative Analysis of Fountains in Pompeii and Herculaneum

Substantial urban development is linked to the first century CE in Pompeii and Herculaneum, as well as throughout the Bay of Naples. An important component of this development included the construction of the Aqua Augusta, or Serino Aqueduct as it is known today. The associated lead pipe network supplied pressured water for private residential display, businesses and public fountains. Water collected from public fountains was especially valuable as population density increased and more people came to live in apartments that lacked traditional means of water collection (e.g., cisterns). In the summers of 2018 and 2019, the authors conducted fieldwork in order to investigate the fountains at Pompeii and Herculaneum. Our initial research focused on the fountains in Pompeii. However, the question remained, are all fountains in the Roman world the same? This paper expands on previous research and focuses on the significant differences in construction and use wear of fountains between the neighboring towns.

[159]

Chair

Trusler, Kate [159] see Bernstetter, Jessica

Trusler, Kate [212] see Green, Amie

Trusler, Kate [85] see Lorenz, Wayne

Tryon, Christian [162] see Borreggine, Marisa

Tsai, Che-hsien (University of Sheffield), Elina Kardamaki (OREA Institut für Orientalische und Europäische Ar), Christos Boulotis (Academy of Athens, Greece), Anno Hein (NCSR Demokritos, Greece) and Peter Day (University of Sheffield)

[196]

"Mycenaean" and Local Pottery Production at Koukonisi, Lemnos

The study of pottery from the Bronze Age settlement of Koukonisi, Lemnos offers new evidence for local production and consumption of Mycenaean pottery during the fourteenth century BCE, together with imports from the heartland of the NE Peloponnese. On Lemnos, local Mycenaean pottery reproduces shapes and motifs of the Mycenaean mainland sites, while also belonging to a north Aegean koine that includes nearby Troy. However, in contrast to its neighbour, other standard Mycenaean pottery, such as fine plain wares, also locally produced, are well represented at Koukonisi. Most importantly, the common local red slipped ware seems relatively unaffected by the Mycenaean repertoire. This lies in contrast to other parts of the Eastern Aegean and notably Troy, where hybrid shapes and decorations have been noted. This previously undocumented, substantial production of Mycenaean pottery on Lemnos is important, as it matches chemical compositional groups usually attributed to Trojan production. The evidence from Koukonisi, therefore, offers the potential to alter our view of the interface between Mycenaean and other cultures. It also suggests the existence of different processes of acculturation at Troy and Koukonisi, and a diversity of interaction with the southern Aegean and Mycenaean Greece between areas of the North Aegean.

Tsai, Howard (University of Michigan)

[106]

Espacio ritual como área de producción de la identidad étnica: El caso de Las Varas, un sitio del valle medio del Jequetepeque, Peru

En esta presentación se discute los resultados del Proyecto Arqueológico Las Varas. Se sugiere que el proceso de formación de identidad étnica ocurrió en el contexto ritual. Las Varas fue un sitio del Intermedio Tardío (1000–1460 d.C.) ubicado en el valle medio del Jequetepeque con la afiliación de la cultura Cajamarca Costeña; se encuentra entre otros sitios de las culturas Chimú y Lambayeque del mismo periodo. Se presenta evidencia de dos áreas de Las Varas: Plataforma de Recepción (Sector 1, Área A) y Plazas de los Malquis (Sector 3, Área A). Ambas áreas están cerca la salida y entrada del sitio a la costa (Plataforma de Recepción) y sierra (Plazas de los Malquis); los datos de excavaciones indican que ellas fueron utilizadas como espacios rituales para recibir visitantes de otras zonas. Diferencias importantes, sin embargo, se caracterizan los dos espacios rituales. Se plantea que estas diferencias (tamaño del espacio, presencia de etapas constructivas y asociación con estructuras mortuorias) reflejan las decisiones de la comunidad de Las Varas en su construcción de identidad. Se sugiere que el análisis del espacio ritual puede ser una aproximación para revelar el proceso de la producción, reproducción y transformación de las identidades sociales y étnicas.

Tserndagva, Yadmaa [62] see Farquhar, Jennifer

Tsesmeli, Evangelia (NM State Land Office) and David Eck (NM State Land Office)

[186]

Challenges in Protecting Cultural Resources: Policy and Rulemaking from a New Mexico Perspective

Policies, rules, and laws for the protection of cultural resources are in place at the federal and state level. This research discusses the challenges in instituting a workable cultural resource protection policy on New Mexico State Trust Lands and the processes that must balance a variety of cases and needs among a diverse body of decision-makers, stakeholders and practitioners. It also presents a culture history of competing interests of historic preservation, commercially feasible outcomes, and the effects of political complexity in policy and rulemaking.

Tsuji, Leonard [252] see Powell, Evelyn

Tsuji, Stephen [252] see Powell, Evelyn

Tsukamoto, Kenichiro (University of California, Riverside) and Octavio Esparza Olguín (Centro de Estudios Mayas, Instituto de Investigaci)

[130]

The Dynastic Sequence and Royal Titles at the Classic period Maya Site of El Palmar, Mexico

The sociopolitical implication of Classic Maya royal titles has been the subject of considerable debate over the past half-century. El Palmar, which is located in southeastern Campeche, Mexico, had a long dynastic sequence beginning from the Protoclassic until the Terminal Classic period (AD 179–884). Based on inscriptions found in and around El Palmar, this paper addresses the question of how internal and external political organizations were articulated with El Palmar royal titles. Inscriptions carved on Stela 20, which was discovered during the 2018 field season, also provide clues to the relationship between royal titles and regional interactions among dynasties around AD 511, a period witnessed political interventions of the Snake dynasty in southeastern Campeche. Our epigraphic studies suggest that the El Palmar royal titles served to symbolize a royal identity as well as an internal hierarchy.

Tsukamoto, Kenichiro [7] see Jonassen, Alexandra

Tsukamoto, Kenichiro [232] see Sullivan, Kelsey

Tsukamoto, Kenichiro [197] see Wedemeyer, Rachael

Tsurumi, Eisei [182] see Kanezaki, Yuko

Tucker, Bryan [140] see Cochran, Lindsey

Tucker, Gregory (University of Michigan)

[107]

Geophysical Survey in the Nile Valley: Changing Perceptions of Ancient Landscapes in the Jebel Barkal Region

The heartland of Napatian Kush has long been understood through the monumental structures unearthed by a tradition of archaeological work dating back to the early twentieth century. As part of a recent project to try to expand our knowledge of settlement in the region around Jebel Barkal, near the fourth cataract of the Nile River, we have conducted a geophysical survey of the surrounding landscape, exploring the areas further removed from the pyramids, temples, and palaces that oft define this site and period in history. In this paper, we present our results and interpretations, and the implications for changing our perception of this space at a variety of levels. Our perception of the past has changed, both at a site and a regional scale, but this also has implications for the modern perception of the surveyed areas, as they are often areas of mixed-use for the communities that live surrounding them. This project expands our understanding of the sites and landscapes in this region, but also serves as the foundation for future archaeological discovery and heritage management planning.

Tucker, Kaley (University of Utah Archaeological Center), Lisbeth Louderback (Department of Anthropology and Archaeological Cent) and Erick Robinson (Department of Sociology, Social Work, and Anthro)

[177]

Evidence for Geophyte Exploitation in the Green River Basin of Wyoming

Archaeological sites in the Green River Basin of Wyoming that date from the Early Archaic to Late Prehistoric are often found associated with or adjacent to dense patches of *Cymopterus bulbosus* A. Nelson (springparsley). This nutritious geophyte would have been an important food source for prehistoric humans living in the region. Experimental data have shown that the caloric return rates of *C. bulbosus* were enough to support seasonal exploitation by foragers, yet there has been no direct evidence in the archaeological record for use. In this study, we examine starch grains from 10 metates excavated from two archaeological sites in the Green River Basin to determine if *C. bulbosus* was consumed in the past. Rootstocks of *C. bulbosus* were collected from three different populations (patches) in the vicinity of the archaeological sites to develop modern starch reference material. Positive identification of *Cymopterus* starch grains is based on a systematic study of those reference grains. The presence of *Cymopterus* starch on the ground stone artifacts strongly suggests that prehistoric foragers were harvesting and consuming these geophytes throughout the Holocene. These findings may also provide additional insight into subsistence and settlement decisions in the Green River Basin.

Tuitavuki, Kylie (University of Hawai'i at Manoa)**[91]***Discussant*

Tulchin, Jon [186] see Duarte, Trever

Tulchin, Jon [262] see Filimoehala, Darby

Tullo, Dominic, Kathryn Krasinski (Adelphi University) and Angela Wade (Chickaloon Native Village)**[184]***Ancient Trails: Community Archaeology in the Talkeetna Mountains*

The Matanuska Valley in Alaska has a rich Athabaskan cultural history. Past archaeological research has primarily been conducted adjacent to the Matanuska River along the Glenn Highway. However, little research has been conducted in the surrounding tributary drainages that feed into the Matanuska river. It is important to test sites throughout the valley's drainages to understand prehistoric movement and land use of the river valley and its tributaries. Survey focused on localities documented through recent interviews with Chickaloon Native Village community members, many of which correspond to localities with Ahtna place names. This poster highlights methods and discoveries in the Boulder Creek drainage that expand the assumed range of Athabaskans living in the valley. These sites have lithics representing a wide range of raw material types. Raw material survey conducted in the Boulder creek drainage demonstrates a variety of high quality toolstone was available.

Tullo, Dominic [82] see Wygal, Brian

Tune, Jesse (Fort Lewis College)**[180]***Paleoindian Lithic Technological Organization and Evolutionary Theory*

It is assumed that lithic technologies used by Paleoindian hunter-gatherers were designed to be efficient, yet flexible. Therefore, it is expected that differences in how lithic technologies were organized may reflect optimizing behaviors made by hunter-gatherers as they encountered different landscapes with variable resource distributions. There was likely increased pressure to behave optimally in environments with limited resources, while those pressures would have been relaxed where greater access to resources existed. In terms of Paleoindian hunter-gatherers, these behaviors may be reflected in the use-lives of projectile points. Where there was greater access to high-quality toolstone, projectile points are expected to have been discarded before their total utility was exhausted; where there was limited access to toolstone resources, projectile points are expected to be more exhausted. The research presented here relies on evolutionary theory to bridge the gap between lithic technology and hunter-gatherer behavior as is evident in fluted point assemblages.

Tung, Tiffany [61] see Scaffidi, Beth

Turcanu-Carutiu, Daniela, Rodica-Mariana Ion (ICECHIM, Bucharest, Romania), Alessandro Ravotto (Institut Català d'Argueologia Clàssica [ICAC]), Sorin Tincu (Corvin Castle, Hunedoara, Romania) and Verginica Schroder ("Ovidius" University of Constanta, Romania)**[159]***Protecting the defenses by Preservation of Fortresses Protecting the defenses by preservation of fortresses: Barcino, Civitas Tropaensium, and Corvin Castle*

Currently, four ancient and medieval monuments ("The Roman mosaic of Constanta" (fourteenth century), "Adamclisi Tropaeum Traiani" (109 AD), and "Castle of the Corvins of Hunedoara" (fifteenth century) in Romania, and the "Roman Wall in Barcelona" (14 AD), Spain) could be the right cases for scientific tests, due to the long European tradition of restoration, which may even offer a new idea in the integrated synergistic diagnosis process. Nowadays, however, things have changed: on the one hand, the physical, chemical and biological degradation of stone and fresco surfaces are amplified by pollution, demographic pressure, etc.; on the other hand, the technology allows more detailed control over the processes and materials involved in restoration. In this sense, an evaluation of biofilm could represent a valuable addition to the local repertoire of techniques, especially if there are symptoms similar to those already observed in recent studies (defoliation of the structural stone of the wall, detachment of medieval frescoes, mosaic erosion, etc.). The observations and the monitoring of these ancient and medieval monuments from Romania and Spain are an example of how this approach becomes an opportunity to identify issues common to several types of cultural heritage monuments around the world.

Turley, Cameron (The Graduate Center, CUNY), Aká Bendtsen (Ilisimatusarfik [University of Greenland]) and Wendi Coleman (The Graduate Center, CUNY)**[50]***The Alluitsoq Project: Early Results from a Collaborative, Community-Based Archaeological Research Program in South Greenland*

Summer 2019 was the first excavation season of the Alluitsoq Project, a community-based and collaborative research program investigating the former Moravian mission of Lichtenau in South Greenland (established in 1774). Our efforts last summer were rewarded with large artifact and archaeofauna collections, additional ethnographic interviews, new collaborators, a significant expansion in public outreach, mitigation of the ongoing loss of three rapidly eroding Inuit middens, and lessons for further project development. In this paper we build on Turley's presentation from the 2019 SANNA forum to preview our preliminary results from the faunal, organic residue, and ethnographic analyses. Coleman has contributed a discussion on the results of her

zooarchaeological analysis. Turley presents the first round of results from his work with organic residues, analyzing lipids from contemporary comparative and archaeological samples using gas chromatography-mass spectrometry. Bendtsen and Turley then contemplate these early results, looking through the lens of ethnographic interviews and oral histories from 10 community elders, all former or current residents of Alluitssoq. These multiple lines of evidence combine to form a picture of how material culture plays its role in mediating colonial interactions, in mediating cultural persistence and change, and in mediating new forms of identification in South Greenland.

Turner, Bethany (Georgia State University), Molly Zuckerman (Mississippi State University) and Haagen Klaus (George Mason University)

[131]

Doing Context-Specific, Anthropological Bioarchaeology: Hard Times from England to the Andes

The concept and approach of 'bioarchaeology as anthropology', wherein bioarchaeology is framed as interdisciplinary, hypothesis-driven, biocultural, cross-cultural, and focused on understanding the adaptation and evolution of social systems, was pioneered by George Armelagos and has been progressively strengthened and amplified by the work of Debra Martin. Martin's prolific body of work has particularly emphasized the crucial importance of operationalizing social theory, and rigorously engaging with 'culture' as multi-dimensional, dynamic, and contingent. In doing so, she creates deeply contextualized interpretations of human remains that provide emic explanations of complex biocultural phenomena in past societies, such as violence. Here, we demonstrate the continuing power, scope, and applicability of her approach—particularly for investigations of structural violence in past societies, as well as resistance to it—through two diverse case studies. The first uses osteological and multi-isotopic analyses in Spanish Colonial Lambayeque, Peru to theorize indigenous foodways as avenues of cultural resilience. The second investigates skeletal evidence of poor women's agency in seeking treatments for syphilis infection in post-medieval England despite gendered social inequality and misogynistic medical ideologies that historical records suggest greatly limited access to treatments. These disparate examples help underscore Martin's significant influence in shaping an anthropological, twenty-first-century bioarchaeology.

Turner, Michelle (Crow Canyon Archaeological Center), Karen Adams (Independent Consultant, Tucson, AZ) and Jean Berkebile (Apache-Sitgreaves National Forests)

[235]

Domesticated Amaranth (Amaranthus) at the Aztec North Great House, New Mexico

Amaranth (*Amaranthus* spp.) has long been an important resource in the American Southwest, as evidenced by the archaeological record and the traditional knowledge and practices of Indigenous communities that have used it for both food and dye. However, archaeologists have limited evidence as to how early the domesticate appeared or how widely it ranged, due largely to the difficulty of distinguishing charred domesticated seeds from those of the very common native wild varieties. Recent archaeological testing at the Aztec North great house, a Chaco Canyon outlier occupied in the late eleventh to mid-twelfth century CE, has demonstrated the presence of domesticated amaranth seeds mixed with wild amaranth seeds. This research reveals that domesticated amaranth seeds come in four colors, white/cream, black, and dark and light tan, and in two sizes of black (large, small). We will discuss the significance of these seeds within the context of archaeobotanical research in the Southwest and in relation to other archaeological findings at this previously unexcavated Chacoan outlier great house.

Turner, Michelle [149] see Schleher, Kari

Turner, Michelle [147] see Schwindt, Dylan

Tushingham, Shannon (Washington State University)

[15]

Evolutionary Models of Leadership, Risk, and Decision-Making among Women

Human Behavioral Ecology (HBE) models of leadership tend to focus on elucidating the conditions under which top-down (largely male) leadership emerges. These may include models of dominance, prestige, as well as collective action, which predict that under certain conditions (e.g., increased population pressure), risk influences autonomous individuals into accepting leadership in collective actions to buffer freeloading and increase payoffs. Household-level dynamics, leadership, and decision-making by women are less explored areas of research, yet they hold particular relevance to developmental models of hunter-gatherer delayed return economies. A critical piece of the equation is elucidating risk and differing strategies between women (risk averse) and men (risk prone). In this paper I examine these ideas and aim to (1) review relevant HBE models that frame risk and leadership by men and women and discuss key gaps in archaeological discourse; (2) discuss how HBE logic, particularly that which centers on childcare opportunity costs, intensification, and decision-making revolving around the costs of storage, applies to foraging communities in seasonal environments; and (3) propose that women's leadership and risk averse strategies are key to understanding the evolution and stability of small autonomous social units among foragers in much of western North America.

Tushingham, Shannon [233] see Fournier, Nichole

Tushingham, Shannon [72] see Fulkerson, Tiffany

Two Bears, Davina [41] see Campbell, Wade

Tykot, Robert (U. of South Florida) and Andrea Vianello (U. of South Florida)

[199]

Sources and Distribution of Palmarola Obsidian in the Central Mediterranean during the Neolithic

The tiny island of Palmarola, about 35 km south of Cape Circeo (between Rome and Naples, Italy), was an important source of

obsidian during the Neolithic in the Central Mediterranean. While thought to have been a minor source, compared to Lipari and Sardinia, extensive artifact analyses in recent years of museum and other collections show that Palmarola obsidian was widely distributed, although the use of non-destructive pXRF spectrometers were not capable of distinguishing the three source subgroups identified through geological survey and analyses by INAA and LA-ICP-MS. Analysis by pXRF has enabled testing of complete archaeological assemblages and has led to the identification of Palmarola obsidian within lithic assemblages at more than 60 archaeological sites throughout peninsular Italy as well as in Corsica, southern France, the Adriatic, and Croatia. Very rarely, however, was Palmarola the only obsidian source used at the archaeological sites that have been tested, and it was the major source at only 25%. The techno-typological characteristics of each artifact were also recorded in order to assess potential production and use patterns. When possible, the contexts and chronology of the lithic assemblages were incorporated in assessing and enabling potential statistical comparisons over time, space, and raw material.

[199]

Chair

Tykot, Robert [80] see Taylor, Corinne
Tykot, Robert [159] see Vianello, Andrea

Tzortzopoulou-Gregory, Lita [36] see Kardulias, Paul Nick

Uchida, Junko [205] see Mizoguchi, Koji

Ugalde, Paula (University of Arizona), Virginia McRostie (Pontificia Universidad), Eugenia Gayo, Claudio Latorre (Pontificia Universidad) and Calogero Santoro (Instituto de Alta Investigación)

[74]

Sociocultural Trends and Innovations along 13,000 Years of Plant Use in the Atacama Desert, Chile

In the Atacama Desert, plant resources are scarce and unevenly distributed due to water availability. However, by compiling all the available archaeobotanical evidences since the late Pleistocene (ca. 13,000 BP) until the Inka epoch (ca. 450 BP) in a single database, we demonstrate that populations ranging from mobile hunter-gatherer bands to sedentary people relying in agriculture, managed plants from the coastal, highlands, and tropical forest ecosystems. Furthermore, we show that people established routes of interaction to acquire plant resources from very long-distance locations (>600 km). We also demonstrate that by the Formative period (>3,000–1,500 cal years BP), the introduction of a wide range of farming crops, water control techniques, and cultivation of diverse plants not only ended the chronic shortage of plants characteristic of an hyperarid environment, but marked the establishment of a set of staple foods for the Atacama Desert dwellers. Later, under the rule of centralized societies such as the Inka, people mostly intensified the cultivation of maize. By contrasting the trends of plant utilization along this cultural sequence with socio-cultural changes, paleodemographic and climatic fluctuations, we note that the “green revolution” of the Formative coincides with an exponential increase in the number of people inhabiting the Atacama.

[74]

Chair

Ugras, Funda, Tamer Mertan and Müge Ergun

[83]

Comparing Technological Choices for Grain Processing at Aşıklı Höyük, an Early Neolithic Village in Turkey: Experimental Removal of Chaff from Barley (Hordeum vulgare)

Experimental studies can make significant contributions to understanding the function of grinding stones found in archaeological contexts. Milling technology at the early Neolithic site of Aşıklı Höyük in Turkey is dominated by querns or grinding slabs, but mortars and pestles are not uncommon. Most of the mortars at Aşıklı Höyük are conical block mortars found in proximity to grinding slabs. Unlike the grinding slabs, which are strongly associated with flour production, principal functions of the conical mortars are less certain. The mortars may have expanded processing capabilities to resources like wild nuts, fruits, and herbaceous plants, or they could have been important for dehusking grains prior to flour production. Our experiments compare the effectiveness of two types of pestles (basalt and wood) for dehusking hulled barley (*Hordeum vulgare*) in a conic basalt mortar under two conditions (with and without water). We note that the process of dehusking is more effective when water is added and that productivity is less affected by the choice of a wood or basalt pestle. Importantly, the experiments also allowed botanical remains from the different processing methods to be analyzed and compared to the archaeobotanical data of Aşıklı Höyük. We report on these comparisons as well.

Ulm, Sean [238] see McCarthy, John

Umbelino, Claudia [34] see Gonçalves, Célia

Ungar, Peter [147] see Gozner, Amanda

Urban, Thomas [64] see Junge, Justin

Ure, Scott [147] see Jepsen, Jacob

Uribe, Mauricio

[105]

Las Chacras del Inka en Tarapacá: Imperio o gobernanza en el Tawantinsuyu de los Andes Centro Sur

Tras una prospección recientemente realizada en la Pampa del Tamarugal (Tarapacá, norte de Chile) nos ha proporcionado un sitio excepcional cuyas características monumentales brindan nuevas posibilidades para abordar arqueológicamente el pasado y sus relatos en torno al Inca. En efecto, el sitio Iluga Túmulos da cabida a las memorias materializadas a gran escala por múltiples poblaciones que convergieron en un acotado lugar de Tarapacá y en un amplio rango temporal, desde el Formativo hasta los incas y españoles (2000 años). Dada la escala, densidad y monumentalidad de sus túmulos funerarios, campos de cultivo y los espacios públicos asociados a tiempos antes, durante y después del Inca, se estima que las funciones como significados de éstos a lo largo del tiempo pudieron variar, aunque siempre en relación con la idea de un lugar congregacional de carácter ceremonial que invocaba a los ancestros para la fertilidad agrícola, constituyendo también espacios productivos y políticos. Aprovechando el potencial de Iluga Túmulos, desde una “perspectiva simétrica”, en este estudio nos interesa involucrar el máximo entramado de materialidades, antecedentes y voces en las prácticas y narrativas arqueológicas; intentando alejarnos de la racionalidad cartesiana que propicia las dicotomías gobernantes-gobernados, en mejor sintonía con la historicidad andina.

Uribe, Mauricio [61] see Santana Sagredo, Francisca

Uruñuela Ladrón de Guevara, Gabriela [119] see Torres Porras, Alicia

Usai, Alessandro [196] see Day, Peter

Utting, Benjamin

[36]

Exploring Prehistoric Technology at the Tràng An Landscape Complex, Vietnam

Palaeolithic stone tool assemblages throughout Southeast Asia are characterized by simple stone tools. Past approaches toward identifying technological variability in these assemblages have tended to rely on cultural typological methods, which are poorly suited for assemblages that comprise tools that are rarely curated and that exhibit limited evidence of a formal template. More recent approaches that include attribute analysis and behavioral ecological modeling are proving more adept at identifying and interpreting variability in these assemblages, and placing tool use into its environmental context. This poster addresses the interaction between lithic technology and environmental change at a cluster of Terminal Pleistocene/Early Holocene cave sites in Ninh Bình Province, Vietnam. It synthesizes lithic analysis, raw material studies, and behavioral ecology to deliver new insights into prehistoric tropical hunter-gatherer land use in Southeast Asia.

Uzzle, Stephen (University of Arizona)

[122]

Mobility as a Land-Use Strategy in Prehispanic Southwest New Mexico

Fourteenth-century Cliff phase Salado (AD 1300–1450) villages in southwest New Mexico show interesting contrasts in architecture, burial patterns, artifact accumulation, and other indicators of more frequent mobility in comparison with earlier villages in the same region from the Classic Mimbres period (AD 1000–1130). Despite heavy reliance on maize agriculture in both time periods, Salado period villagers likely employed a land-use strategy relying on more frequent mobility between villages and at larger spatial scales in comparison to Classic Mimbres period residents of the same areas (Nelson and Anyon 1996; Nelson and LeBlanc 1986). This study assesses evidence for changes in mobility in the Classic Mimbres and Salado periods using datasets from numerous excavations in the Mimbres region (Upper Gila and Mimbres Valleys) and examines the implications of different mobility patterns for prehispanic land use strategies.

Vacca, Kirsten (University of California, Berkeley)

[91]

Moderator

[91]

Discussant

Vadala, Jeffrey [175] see Hixson, David

Vagnetti, Lucia [196] see Day, Peter

Vaiglova, Petra, Gideon Hartman (University of Connecticut) and Guy Bar-Oz (University of Haifa)

[159]

Climate stability and societal decline on the margins of the Byzantine Empire in the Negev Desert

In the absence of a high-resolution climate archive in Negev Desert, southern Israel, it has been challenging to reconstruct why the

Byzantine Empire built large towns in this arid region in the fourth century CE—and why it abandoned these settlements three centuries later. In this study, we used the patterns in dietary and mobility behavior of animals discarded in three recently excavated Byzantine Negev sites as a proxy to assess possible climatic shifts that may have led to the collapse of the Byzantine society in this region. We measured matching isotopic sequences in tooth enamel (carbon, $\delta^{13}\text{C}$, and oxygen, $\delta^{18}\text{O}$) and tooth dentine ($\delta^{13}\text{C}$ and nitrogen, $\delta^{15}\text{N}$) to trace possible changes in the region's vegetative cover and the animal's grazing behavior; phenomena that would have responded to climatic fluctuations. The interpretations draw on distinction between 'contracted' vegetation (i.e., inside drainage channels) and 'expansive vegetation', the availability of which sheds light on the micro-climatic conditions in the desert between the fourth to the seventh centuries CE. The combined proxies contradict an earlier proposition that the region became a 'green desert' during the Byzantine period and that climatic deterioration caused the abandonment of these large settlements.

Vail, Gabrielle (UNC-Chapel Hill)

[2]

Earth Deities, Netted Weaves, and an Exploration of Gendered Roles in the Prehispanic Northern Maya Lowlands

Depictions of a netted weave appear frequently in garments worn by female deities in the Late Postclassic Maya codices. They are linked specifically to deities having associations with the fertile earth, shown in both youthful and elderly aspects, who engage in various activities; of these, weaving and the production of cloth are especially salient. In other contexts from the northern Maya lowlands, female figures—or those wearing female-gendered clothing—are likewise portrayed in contexts suggesting links to the female domain encompassing the earth and the region within the earth, as seen in murals from Postclassic Tulum and in sculpted contexts at the Late/Terminal Classic site of Chichen Itza, where recumbent females represent the earth itself. These female images of the earth can be contrasted with others featuring Itzam Kab Ayin—the male creator in his aspect as the crocodilian whose body forms the surface of the earth. This paper seeks to address how representations of deities—in particular, those wearing garments suggesting specific associations with the earthly domain and the creative forces of life—not only reflect prehispanic belief systems, but also provide a glimpse into gendered female and male roles in the Late/Terminal Classic to Postclassic northern Maya lowlands.

Vail, Gabrielle (UNC-Chapel Hill)

[88]

Discussant

Vail, Gabrielle (UNC-Chapel Hill)

[138]

Chair

Vail, Gabrielle [138] see George, Amy

Val, Aurore (Universität Tübingen), Paloma de la Peña (Evolutionary Studies Institute, U. of the Witwatersrand), May Murungi (Evolutionary Studies Institute, U. of the Witwatersrand), Frank Neumann (Evolutionary Studies Institute, U. of the Witwatersrand) and Dominic Stratford (School of Geography, Archaeology and Environmental)

[11]

New Excavations of the Middle Stone Age Deposits at Olieboomspoort, South Africa

Olieboomspoort is one of the few rock shelters in South Africa documenting phases of use going back to the Acheulean and up until the very end of the Later Stone Age. Previous work has focused on the recent phases, consistent with traces left by the last hunters-gatherers present in the area. Little is known about the earlier phases of occupations of the shelter, predominantly associated with the Middle Stone Age (MSA). For a start, the chronology of the MSA units is completely unknown. The MSA material is dominated by lithic artifacts excavated from two test-trenches respectively in 1954 and in 1998. This was attributed to the somewhat ill-defined Pietersburg industry and still awaits full techno-typological analysis. Finally, the depositional and postdepositional context of the archaeological finds remains unclear. In 2018, we started a new field project, with the following aims: (1) to provide a clearer chronological context for the MSA layers; (2) to clarify the stratigraphy and site formation processes; and (3) to technologically re-evaluate the lithic assemblage. Here, we provide some background on the site alongside preliminary results on the archaeological (lithic artifacts) and organic (faunal remains, pollen and phytoliths) content of the deposits and on site formation processes.

Valdes, Alejandro [173] see Punzo Díaz, José Luis

Valdez, Fred, Jr. (University of Texas, Austin) and Rissa Trachman (Elon University)

[53]

Contextualizing Maya Ritual: NW Belize and Neighbors

From their Preclassic beginnings to the historic period, ancient Maya ritual/religion was part of everyday life. All aspects of social and political life among the Maya were conditioned by various religious beliefs and practices. It is nearly impossible to discuss the Maya past without a consideration of "ritual" that likely influenced how one conducted daily activities. A brief review of these particular aspects and the inseparable qualities is provided. Examples of ritual and/in daily integration are discussed from NW Belize as well as cases from immediate neighboring regions.

[53]

Chair

Valdez, Fred, Jr. [253] see Hyde, David

Valdez, Fred, Jr. [169] see Locker, Angelina

Valdez, Fred, Jr. [53] see Stanyard, Zachary

Valentín Maldonado, Norma (Instituto Nacional de Antropología e Historia), Miguel Ángel Butrón Cruz (Proyecto Tamtoc-INAH), Estela Martínez Mora (DEA-INAH) and Adrián Velázquez Castro (MTM-DEA)
[144]

La Estructura F7

En el año 2015 se delimitó la pequeña plataforma del grupo F, denominada como estructura F7. Durante dichos trabajos fueron encontrados un "joyel del viento" y otras singulares piezas de concha características de la identidad huasteca. Ello permitía inferir que dicho edificio tenía una importancia singular. En 2016 se realizó la excavación extensiva de la estructura, lo que permitió saber que había sido edificada en un solo momento constructivo, durante el periodo Posclásico tardío. De la misma forma, se localizaron tres entierros y singulares depósitos de objetos, posiblemente de carácter ritual. El propósito del presente trabajo es dar a conocer estos hallazgos e intentar entender la intencionalidad de su enterramiento.

Valentín Maldonado, Norma [10] see Velazquez, Adrian

Valle de Tarazaga, Fran [240] see Fitzpatrick, Leslie

Vallejos, Joshua

[71]

Degrees of Change: Transition from Paleoindian to Archaic

The transition between the Paleoindian (13,000–8,000) and Archaic (8,000–1,000) Periods continues to elude North American archaeologists. It is inferred from archaeological evidence that human populations were nomadic hunter-gatherers during both periods. The creation of storage pits, however, provides evidence for some seasonal sedentism during the Archaic Period. This development may have been influenced by climate change at the end of the Ice Age. Stable Isotopic Analysis of faunal remains allows archaeologists to capture a snapshot of past climate in a given area. Water Canyon in Magdalena, New Mexico, has yielded two overlapping bison kill sites. The older kill site dates to the late Paleoindian while the younger site dates to the Early Archaic. Stable Isotopic Analysis can be performed on the bison remains to determine the paleoecology of the area for two different periods. Data derived from Stable Isotopic Analysis may then provide archaeologically based evidence for the effects of climate change as a factor contributing to cultural continuity and change in the American Southwest. The transition from nomadic lifestyles to seasonal sedentism in the region, for example, may have been influencing by environmental agents visible within isotopic signatures.

Vallejos, Joshua

[91]

Discussant

Van Alst, Emily (Indiana University)

[41]

Chair

Van Alst, Emily (Indiana University)

[60]

Examining Interpretations of Gender in Rock Art Research on the Northwest Plains

Despite ethnographic evidence of women participating in the creation and curation of rock art on the Northwest Plains, there seems to be an issue in regional archeologists ignoring or forgetting to include women in their interpretations of rock art sites. In this paper, I seek to quantitatively demonstrate that this bias is present through a meta-analysis of site forms, books, articles, and chapters detailing rock art sites in Wyoming, Montana, and western South Dakota. By analyzing both writings that have become the academic canon of the region's rock art scholarship as well as other works that are not widely cited, I examine this potential lacuna in regional rock art research and make suggestions as to how best to address the issue at both the local, methodological scale and the broader theoretical scale.

Van Alst, Emily [41] see Gover, Carlton

Van Alstyne, Benjamin (UNLV), Karen Harry (UNLV) and Daniel Perez (UNLV)

[142]

Archaeological Investigations at a Multicomponent Site on the Shivwits Plateau

During the summer of 2019, members of the University of Nevada, Las Vegas excavated two rooms within Pete's Pocket, a Virgin Branch Puebloan site located on the Shivwits Plateau, Arizona. The rooms, which were located about 300 m from the north rim of the Grand Canyon, were contiguous and circular, forming an almost Figure 8 shape. An unusually large amount of architectural rubble was associated with one of the rooms, suggesting it likely had been a tower. The second room contained numerous handstones on its floor, and a piece of leather within its wall. The implications of these findings are discussed.

van Dommelen, Peter (Brown University)

[196]

Discussant

van Dongen, Bart [120] see Pal Chowdhury, Manasij

Van Dyke, Ruth (Binghamton University)

[108]

Materiality and Memory in Northwest Iberia: Water, Metal and Stone

In this paper, I explore the attractant qualities of water, metal, and stone as they have intertwined with human memory-making over three millennia in northwest Iberia. During the Bronze and Iron Ages, the confluence of the Rios Sar and Ulla may have been an important liminal space, as people consigned weapons and other metal implements to their depths. The rivers attracted sea traders, connecting them with inland sources of tin and gold. Romans brought the watery cult of Neptune when they established the stopover of Iria Flavia along the Via XIX. Centuries later, Christians transformed an altar to Neptune into El Pedrón—the stone believed to be the anchor for the boat that brought the body of Santiago up the Rio Sar. Today, this ancient, repurposed stone and the church that houses it is an important part of Catholic and tourist pilgrimage to Santiago de Compostela. Working from published archaeological and historical investigations, I trace the role of materials in the construction of memory over time in and around Padrón, Galicia.

Van Etten, Heidi (University of Wyoming Archaeological Repository) and Marieka Arksey (Office of the Wyoming State Archaeologist)

[193]

Public Outreach: A Child's-Eye View

Between the ages of eleven and seventeen, children are independently exploring interests and ideas that, if nurtured, they will carry into adulthood. At this crucial stage of development, ideas and attitudes acquired through active learning will have far-reaching impacts. When asked, a group of respondents from this age group felt the majority of science-based outreach activities and opportunities did not apply to them, either because activities were focused on small children, for adults only, or because they were boring. By listening to children who should be a target audience in many outreach events and projects, archaeologists have an opportunity to widen our audience and increase the effectiveness of our outreach endeavors. The lessons learned through larger archaeological outreach programs can also be adapted and applied to CRM companies striving to meet new public outreach requirements.

van Gijn, Annelou (Leiden University), Diederik Pomstra, Annemieke Verbaas (Leiden University) and Leo Wolterbeek

[199]

Life and Death of an Experimental Reconstruction of a Late Neolithic House

In 2012 an experimental reconstruction was built of a Late Neolithic house, based on a houseplan from the Vlaardingen culture (3400–2600 BC). The entire building process was documented and quantified: materials, labor and tool use. Over the years the house was used by students for their experiments, whereas school kids experienced how it is to live in the Stone Age. In the early spring of 2019 we burned down the house, fully documenting the entire destruction process. A few months later the remains were excavated. In this paper the biography of the house will be discussed, from the construction to the excavation. What could still be told about the original construction from the excavated remains, what was left of the activity areas within the house and what kind of taphonomical processes had already taken place? Last, the excavated postholes of the burned house are compared to those documented for the original archaeological houseplan which formed the departure point of the reconstruction.

Van Gijsegheem, Hendrik (Pointe-à-Callière, Montreal's archaeology and history complex)

[231]

The Archaeology and History of United Canada's First Parliament in Montreal (1844–1849)

In 2017 Montreal's Pointe-à-Callière museum continued a program documenting the remains of a forgotten gem of Canada's architectural and political history: the St. Anne Market/Parliament of United Canada building. Built over the St. Pierre river in 1832 as a massive feat of civil engineering, it was burned down in 1849, the apotheosis of unfolding antagonism in colonial political philosophies. However, complex and unforeseen historical circumstances have led to the amazing preservation of these unique remains. Few sites have yielded such a diversity, richness, and quality of Victorian-era material culture. Moreover, the overall project has led to other stunning, non-archaeological discoveries that will be presented here.

van Keulen, Fred [215] see Ahlman, Todd

Van Keuren, Scott (University of Vermont), Jeffrey Ferguson (MURR Archaeometry Laboratory) and Mark Agostini (Brown University)

[120]

Gray Ware Pottery Circulation and the Eruption of Sunset Crater

The eleventh-century eruption of Sunset Crater reshaped cultural landscapes in northern Arizona. Plain ware pottery distributions hint at population resettlement and the emergence of new social relations. Using Neutron Activation Analyses (NAA) of San Francisco Mountain Gray Ware, we trace connections between pre- and post-eruption settlements in the Sunset Crater area and the Cohonina heartland to the northwest. These data reveal new economies of pottery production, but also speak to the notion that utilitarian pottery was manufactured where it is found and can thus serve as a proxy of cultural boundaries in the past.

van Leeuwen, Willem, Kyle Hartfield (University of Arizona), Sarah LeRoy (University of Arizona), Jeremy Weiss (University of Arizona) and Lauren Meyer (NPS Vanishing Treasures Program)

[186]

A Cultural Resources Environmental Vulnerability Assessment Tool for National Park Service Intermountain Region Management Units

Climate variability and change pose risks to landscapes and the cultural resources in National Park Service (NPS) Intermountain Region management units. The NPS Intermountain Region stretches from Montana to Texas. Cultural resource environmental vulnerability assessment is the first step in developing a plan for adapting to climate-related risks. Moreover, some assessments lack consideration of projected climate changes. Using the most recent climate models (those also used in the Fourth National Climate Assessment), we can quantify the vulnerability of at-risk material types and prioritize parks with at-risk resources. The Cultural Resources Vulnerability Assessment Tool (CREVAT) is a geospatial web application that maps current environmental and future climate exposures to model the vulnerability of material types found at cultural resource sites. The application displays a number of exposure layers representing the degree to which environmental factors impact an area. These exposure layers currently include: Change in Days with Precipitation Less than 0.01-Inch and Greater than 1-Inch, Wildfire Hazard Potential, Change in Freeze Thaw Frequency, Change in Annual Maximum Temperature, and Soil Erodibility Factor. The reports and graphical outputs of the assessment tool are inputs to park-based scenario planning processes, helping managers to develop potential adaptation strategies.

Van Slyke, Andrew (University of West Florida) and Hunter Whitehead (TerraSond)

[18]

Testing Photogrammetric Methods on Submerged Precontact Sites in Florida

In 2019, members of the Submerged Paleo-Landscape Archaeological Survey and Heritage project (SPLASH) tested photogrammetric methods on three submerged precontact sites in Florida. Photogrammetric methods have been widely utilized to interpret submerged historic sites; however, this has not been the case for submerged precontact sites. At the Lewis-McQuinn site (8DI112) in the Suwannee River, the Page-Ladson site (8JE591) in the Aucilla River, and the Clint Scallop Hole site (8JE1796) in Apalachee Bay, each in unique underwater environments with variable sediment types and visibility, divers collected video of geologic profiles and artifacts discovered in situ to test 3D modeling capabilities. The methods of collecting imagery for the creation of photogrammetric models of submerged precontact sites and geologic profiles are discussed here. The results from one site in the Gulf of Mexico and two riverine environments in Florida demonstrate the promise photogrammetry has for the recording and interpretation of inundated precontact sites.

Van Slyke, Andrew [18] see Smith, Morgan

Vance, Ashley (University of Illinois, Chicago) and Benjamin Carter (Muhlenberg College)

[257]

Non-Dietary Applications of Spondylus in Precolumbian Ecuador

The family Spondylidae is comprised of bivalve mollusks called "Spiny Oysters," or *Spondylus*, which have delicate fleshy bodies guarded by a "thorny" calcium carbonate shell. Two species of *Spondylus*, *S. crassisquama* (*S. princeps*) and *S. limbatus* (*S. calceifer*) occupy the warm Pacific waters of Ecuador and Peru. Archaeological, ethnographic, and iconographic sources have demonstrated the importance of these shells in prehispanic Andean communities. This presentation highlights new research on precolumbian archaeological use of the bivalves in Ecuador, paying special attention to historical shell harvesting and marine resource exchange in the Andean region. This talk will also address new research using archaeomalacological approaches, including sclerochronology and GIS mapping of natural distributions.

Vander Linden, Marc (University of Cambridge) and David Meltzer (Southern Methodist University)

[173]

"You shall not oppress your neighbor, nor rob him" (Leviticus, 19.13): Methodological and Practical Considerations to Reassess the Genetics-Archaeology Dialogue

The self-proclaimed ancient genomic revolution is oft-likened to the radiocarbon revolution of the 1950s. Yet, while each provides important insight, these are merely methodological tools. The data they provide may be necessary to answering archaeological questions, but are rarely sufficient. Consequently, archaeologists need to become better able to understand aDNA methods and data, just as geneticists need to learn about archaeology. So what can be done to ensure a more symbiotic relationship? First, aDNA data and results need to be made less opaque. Sequences deposited in genbanks are of limited use to most archaeologists who, for example, could make better use of eigenvalues or consistent admixture values for all individuals, for exploratory data analysis. Second, archaeologists do not need to become aDNA specialists, but need to engage more with genetics to be able to gain a critical understanding of what aDNA can and cannot offer. Third, all parties need to actively collaborate in framing analytical question(s), interpreting data, and putting the salient results in a larger context. Hopefully that will come as genetic research becomes more hypothesis-driven, for then data can be evaluated not just on its internal genetic consistency, but whether it makes sense in terms of archaeology.

Vanderugten, John [77] see Waters, Albert

VanderHoek, Richard (Alaska Office of History and Archaeology)

[69]

The Survival of the Spearthrower: An Overview of Throwingboard Technology from Northwestern North America

Northwestern North America provides a variety of evidence for spearthrower use, from ice patches and other archaeological sites to

extensive ethnographic documentation for sea mammal hunting. This paper will give an overview of archaeological and ethnographic evidence for spearthrower and dart use in this broad region, focusing on the variation in marine throwingboards between regions and through time. For example, comparison of archaeological and ethnographic examples shows continuity of style in throwingboard use on northern Kodiak Island, where wet site archaeological finds show continuity of design for at least 700 years, yet on Alaska's northern coast, throwingboards from frozen sediments show a dramatic change in the last 1,000 years. Northwestern North America has one of the very few areas in the world, the Yukon River Delta, where the throwingboard is still used for hunting, being the tool of choice for ensuring the recovery of marine mammals hunted in fresh/brackish water. Work by traditional carvers and archaeologists are bringing throwingboard and dart use back at tribal culture camps and with other groups in the region.

VanDerwarker, Amber (UCSB)

[1]

Chair

VanDerwarker, Amber (UCSB) and Dana Bardolph (Northern Illinois University)

[72]

Analytical Approaches to Identifying Inequities

Recent years have witnessed a resurgence of interest in how gender bias and a lack of diversity has affected the work that archaeologists produce, interest that dovetails with current concerns about equity and safety issues. A series of recent publications, in archaeology and in the broader realm of academia, employ different methods of data collection and analysis to document inequities in various scientific fields, from publication to grant funding to salary disparities along gendered lines. In this paper, we discuss the methodological complexities associated with doing this type of work. We highlight a variety of examples of statistical measures and data visualization techniques from case studies in archaeology and other disciplines to explore best-practice approaches to studying inequity in a robust quantitative manner. The more rigorous we are in the application of analytical techniques to identify disparities, the more likely we are to be effective at recommending and implementing changes within these spheres.

VanDerwarker, Amber [1] see Meyers, Maureen

Vandiver, Pamela [261] see Klesner, Catherine

Vang, Natasha [61] see Scaffidi, Beth

VanPool, Christine

[99]

Discussant

VanPool, Christine [136] see VanPool, Todd

VanPool, Todd (University of Missouri) and Christine VanPool (University of Missouri, Columbia)

[136]

"Watching from the Hidden Place": Linking Ritual Space at Paquimé Using Architecture and Mirrored Features

Paquimé, the largest settlement during the Medio period (AD 1200–1450) occupation of northern Chihuahua and southern New Mexico, has striking examples of communal spaces including two large public ball courts, ceremonial mounds in open plazas, and enormous agave roasting pits that were likely central to communal feasting. Many of these communal places are symbolically linked and at times directly linked through line-of-sight pathways with interior, private areas within the roomblock. For example, the interior "ceremonial" ball court mirrors the two communal I-shaped ball courts outside of the roomblock. The Mound of the Heroes was linked through a series of strategically placed windows to an interior plaza where the activities at the Mound could be watched and likely augmented by rituals in hidden places. Here we examine the link between communal spaces and private locations to gain insight into their linked ritual and social uses. Our analysis reflects the ways that private 'high ritual' and communal ritual interact to create, modify, and legitimize each other.

VanValkenburgh, Parker (Brown University)

[32]

Moderator

VanValkenburgh, Parker [242] see Plekhov, Daniel

Vanzetti, Alessandro (University of Rome "La Sapienza")

[207]

Discussant

Vanzetti, Alessandro [196] see Levi, Sara

Vargas, Juan Pablo [257] see Yamamoto, Atsushi

Varien, Mark (Crow Canyon Archaeological Center), Grant Coffey (Crow Canyon Archaeological Center), Gert Riemersma (Routescene), Vincent MacMillan (BLM Canyons of the Ancients National Monument) and Steve McCormack (Caddis Aerial)

[147]

Lidar Mapping Sand Canyon Pueblo: Technical Collaboration for Site Visualization and Reassessment

The Research Institute at the Crow Canyon Archaeological Center partnered with Canyons of the Ancients National Monument and two private companies, Routescene Inc. and Caddis Aerial, to conduct a lidar survey of Sand Canyon Pueblo. The drone-based lidar data penetrates the dense vegetation present on the site to make a highly accurate map. This allows archaeologists and the public to better visualize the site and augments previous mapping efforts. Working together, we collected the data, finalized the site imagery, produced a video explaining the project, and published a description of the project that appeared in several venues. This poster details the work done as part of this project and focuses on new interpretations of the site made possible from the lidar work. We also describe how lessons learned from this project will influence the future use of this technology at other sites in the area. Finally, this project provides an important opportunity to augment and assess previous maps of Sand Canyon Pueblo produced by Crow Canyon during its excavations there from 1984 to 1993.

Varillas, Rosa María (University of Illinois, Chicago), Carol Rodriguez Romero (Pontificia Universidad Catolica del Peru) and Francesca Fernandini

[243]

Dyed Threads and Identity in the Cerro de Oro Textiles

In order to shed light on the nature of the people that inhabited a prehispanic city in Peru between two well-defined moments of occupation, the authors explore the usage of color in textiles through two central aspects: a technical analysis of the manufacturing attributes of dyed threads, and a visual study on the different color groups found in the sample through color palettes. The main goal is to establish any changes in color use and production over time, as well as any particular preference in raw materials or spin of threads that were to be dyed compared to the naturally colored ones. With this data, the authors will explore the nature of the people living in Cerro de Oro, Cañete, between AD 550–850 and the group who used the archaeological site as a burial space between AD 900 and 1000. Here color works as a key attribute that seeks to define a Cerro de Oro identity.

Varley, Emily (Baylor University)

[51]

Analysis of the Fortification of San Giuliano in Lazio, Italy

Every inhabited space tells a story about the cultural values, social norms, and lives of those who utilized the space. This paper focuses on the archaeological remains of a medieval fortification and presumed castle located in Barbarano Romano, Italy atop the San Giuliano plateau. It discusses the excavated ruins as a source of data for understanding how this castle was once a social space as well as examining the implications the space likely had on social actors who interacted within the fortification. By integrating material evidence collected over four years of excavation, historical sources which refer to the site and other similar sites, and spatial analysis, I will draw conclusions about the space and how it reveals cultural values and social norms as well as tells a story that gives insight into the lives of those in the past.

Varney, R. A. (PaleoResearch Institute Inc.) and Linda Scott Cummings (PaleoResearch Institute Inc.)

[66]

What Happens When Your Depositional Record Appears to Be Scrambled: Interpreting the Deposition, Radiocarbon, and Pollen Signatures for Bijou Creek, Colorado

The West Bijou Creek site, 5AH04, is situated in eastern Colorado on the first terrace above West Bijou Creek, an entrenched meandering stream that flows from the Palmer Divide to join the South Platte River. The stratigraphic record, exposed in a cut bank, appeared to be intact, so a 5-meter core was extracted and examined to better understand the local and regional paleoenvironment. Radiocarbon dates from 18,000 to 945 RC, collected from obvious strata, were out of order, suggesting a punctuated depositional and erosional history. A detailed pollen record, supported by six radiocarbon dates and XRF analysis at 3mm intervals, at first presented a puzzling record. Upon re-examination, it appeared that alluvial sediments represented cut and fill sequences of meanders rather than continuous deposition. Therefore, re-ordering the pollen and XRF signatures by radiocarbon ages afforded an opportunity to examine this record in age order, revealing periods of elevated pine, goosefoot family, and sagebrush pollen. XRF elements critical in understanding the depositional sequence include sulfur and strontium and the titanium/iron and strontium/calcium ratios. Identifying sediment packages through radiocarbon dating allows paleoenvironmental interpretations not possible without this level of analysis. We discuss challenges and successes of this evaluative process.

Varney, R.A. [66] see Battillo, Jenna

Vasquez Pazmino, Josefina (University of Florida)

[119]

GIS-Toponyms Analysis in Colta Lake Valley (Chimborazo, Ecuador)

Toponymic analysis in archaeology demonstrates the impact of colonialism on the spatial distribution and occupation of the year Colta Lake valley during sixteenth and nineteenth Centuries. The Colta region was home to pluri-cultural settlements in which linguistic interaction between Puruwá, Kichwa, and Spanish languages produced differentiation, syncretism, hybridity, and inkianization. Based on historical maps and the results of the archaeological survey of Colta Lake valley, I have produced a

toponymic study using GIS-mapping to evaluate the trends of the relationships between Puruwá, Inka, and Spanish toponyms. Changes in the agricultural economy and the appropriation of environmental zones, more than religious reasons, better explain the transformation of toponyms under successive waves of colonialism.

Vaughn, Kevin (UC Riverside)

[21]

Discussant

Vavrsek, Jessica (The University at Albany) and John Hart (Research and Collections Division, New York State)

[29]

Pottery and Pipes, What Are They Trying to Tell Us? Interaction between Jefferson County Iroquoians Explored through Social Network Analysis of Pottery and Pipe Motifs

Pottery and pipe decorative motifs are generally thought to change across time, space and group affiliation. While pipes and pottery have been extensively study using various methods, they have only recently been studied in present-day New York, southern Ontario, and Quebec (Northern Iroquoia) using social network analysis (SNA). Analyses to date have primarily focused on pan Iroquoian networks rather than on regions within Northern Iroquoia. To better understand the St. Lawrence Iroquoians living in and around present-day Jefferson County, New York, we have begun to utilize SNA methods to analyze pottery and pipe decorative motifs to elucidate village interactions within this geographically restricted region, and to determine if the roles of individual villages differed in intra- and extra-regional networks. Initial results indicate village interactions between those living within Jefferson County differed from interactions of the same villages in the pan-Iroquoian networks. This is true for networks based on both pottery and pipe decorative motifs. In addition, pottery design motif networks differ from pipe design motifs networks, suggesting that interaction networks may have differed based on gender.

Vázquez-de-Ágredos-Pascual, Maria Luisa [10] see Puértolas, Carlos

Veatch, Shawna [230] see Coughenour, Chance

Veatch, Shawna [53] see Walling, Stanley

Vega, Enrique [28] see Hendrickson, Mitch

Vehik, Susan (University of Oklahoma)

[213]

Origins of Plains Military (Lance) Societies

Conflict was a very common and often remarked upon feature of North American Great Plains cultures following European contact. The institutionalization of conflict among these cultures was marked by organizations known as military, lance, or warrior societies. These societies had distinctive material inventories marked by various animals, colors, and staffs or lances with distinctive points generally made of metal. As conflict was present on the Plains hundreds of years before European contact, military societies likely have their origins there as well. The best material remains of these societies for archaeologists may be lance points as most other remains are unlikely to preserve. Using distinctive forms of very large stone projectile points that likely served as lance points, this poster traces the development of Plains military societies.

Velasco Alban, Janny (Universidad Andina Simón Bolívar)

[257]

Anthropic Soils in Ecuadorian Upper Amazon? Approaches to the ADE Discussion from La Lomita Midden, Upano Earthen Mound Complex, Morona Santiago Ecuador

Since Wim Sombroek's research about Amazonian Dark Earths (ADE) in Brazil, many surveys have related these anthropic soils to the sustainability of great populations for long-term periods in Amazon environments. Brazil has led the investigation in this field, promoting great advances on the understanding of the ancient peoples from the Amazon Basin. Arroyo-Kalin (2014) brings the debate about ADE in Western Amazonia, discussing the possibility of ADE archaeological sites in Peru, Colombia and Ecuador. In recent years, researchers have worked on anthropic soils in Ecuadorian Amazon; however, they have mildly addressed the issue with mere inferences about anthropic soils in archaeological sites. In 2016, a survey sought to study the effects of human-environment interaction on the stratigraphy of an archaeological Midden from the Upano Earthen Mound Complex (Porras, 1987; Rostain, 1997; Salazar, 2008). This study has produced a chemical characterization of the soils, finding interesting data to understand human landscape transformation. This paper brings into discussion the anthropic soils investigation in Ecuadorian Amazon, contributing to the debate of ADE in Western Amazonia.

Velásquez García, Erik (Instituto de Investigaciones Estéticas de la UNAM)

[223]

Los gobernantes de la dinastía Kaanu'l en Dzibanché, Quintana Roo, México

Diversos hallazgos arqueológicos en Dzibanché (Kaanu'l) y en otros sitios de las tierras bajas mayas orientales han revelado que el asiento original de los gobernantes de la dinastía Kaanu'l o "Cabeza de Serpiente" se encontraba en el sur del actual estado mexicano de Quintana Roo. En esta ponencia se ofrecerá un recuento de toda la información disponible hasta el momento, para

conocer el devenir de los mandatos mayas de ese linaje gobernante, antes de que una rama de ellos se escindiera en 635–636 d.C. y se asentara en Calakmul (Huxte' Tuun). No obstante, aún después de que una parte de la dinastía se asentara en el sur de Campeche, tenemos evidencia de que el núcleo de esa familia gobernante continuó habitando por tiempo indefinido en Dzibanché.

Velazquez, Adrian, Belem Zúñiga (Proyecto Templo Mayor 8va temporada) and Norma Valentín (INAH-Subdirección de Laboratorios y Apoyo Académico)

[10]

Archaeological Mollusks from Xalla

The Project "Teotihuacan, élite y gobierno" (Teotihuacan elite and government) has excavated 420 artifacts made of mollusk's shells. Ninety-one of them are objects, and 166 are valves or fragments that present traces of human modification; 163 are fragments with no traces of human work. In this paper, the results of the analyses carried out on this collection are presented, which include biological, typological, and technological aspects.

Velázquez Castro, Adrián [144] see Valentín Maldonado, Norma

Velázquez Galindo, Yuribia [269] see Arieta Baizabal, Virginia

Velchoff, Nancy (University of Texas, Austin)

[170]

Mike Collins and the Chuck Norris Effect

Mike Collins is known for his lithic expertise and Clovis Technology. The Gault Site is best known for at least 2-major components, Clovis Technology and Mike Collins. An archaeological icon for longer than he'd like to admit (more than a half century) is revered for his rare ability to connect to any population or age to inspire excitement about Texas and the peopling of the Americas. 15-minutes doesn't even cover a fraction of the impact that he has had on countless thousands of people, and in order of magnitude one of the hardest tasks any person could ever be assigned. This presentation will attempt to bring some fresh perspective on the excavations conducted in Area 15 as well as others around the Gault Site to honor Mike's monumental achievements and generous spirit that has brought so many people together for a common cause.

[170]

Chair

Velchoff, Nancy [73] see Williams, Thomas

Véliz, Vito [130] see Pineda de Carias, Maria-Cristina

Venter, Marcie (Murray State University) and Lacy Risner (Murray State University)

[227]

A Stylistic Comparison of a Cached Ballgame Yoke from Matacanela, Veracruz

The ballgame complex was an important component of the Classic Veracruz style that spanned the Late or Epiclassic period (AD 600–900) and that was concentrated along the Mesoamerican Gulf lowlands and extended into adjacent regions. The ballgame, however, has early roots, both in Mesoamerica in general and in Veracruz in particular. In this paper, we will situate stylistically, spatially, and temporally a broken yet complete stone ballgame yoke recovered from an in situ Late Classic offering context at the Classic period center, Matacanela, located in the south-central Tuxtla Mountains. Although the date of discard and interment was during the Late Classic, we examine how this yoke compares with the broader corpus of carved stone yokes and consider processes of curation, authority, place-making, and memory in ancient Mesoamerica.

Vento, Frank J. [222] see Freund, Kyle

Ventresca Miller, Alicia (University of Michigan)

[244]

Dairying and Domestication in the Altai Mountains

The Altai Mountains, which delimit the western and eastern steppe, is an integral zone to understanding the timing of the adoption of livestock. The transition to pastoral lifeways across central and inner Asia occurs not as a regular advancement, but in punctuated fits and starts. Whether the Altai are a boundary or one of increased connectivity is unclear, as scholars continue to grapple with evidence for trade and integration. In this paper we access several lines of evidence to clarify human-animal interactions, including an outline of the timing and location(s) of the adoption of domesticated livestock and the consumption of species-specific dairy products. Through detailed biomolecular analyses we demonstrate that ruminant pastoralism and dairying were adopted in the Altai region at an early date, while the introduction of domesticated horses and horse dairy occurred much later. Our results support models where domesticates and dairying are intertwined, albeit with an extended lag time between livestock species. These findings provide needed insight into the trajectory of ancient human-animal interactions in Eurasia.

Vepretskii, Sergei (Russian State University for the Humanities), Dmitri Beliaev (Russian State University for the Humanities), Monica de Leon (Atlas Epigráfico de Petén) and Camilo Luin (Popol Vuh Museum, Guatemala)
[130]

Archaeological Reconnaissance and Excavations at El Encanto (Petén, Guatemala) in 2018

The Maya site of El Encanto is situated 12 km to the northeast from Tikal epicenter. Discovered in 1907 and occasionally visited by various projects throughout the twentieth century, it has never been the subject of large-scale excavations. Based on the map by the University of Pennsylvania Tikal project in 1964 that included two groups, El Encanto was interpreted by Dennis Pulestone as a "minor center" within larger Tikal. In 2018 Atlas Epigráfico de Petén project realized two-week field work that included mapping of the site and test-pit excavations in the South Group. The site turned out to be significantly larger and included at least four large architectural groups with two internal causeways. The Southern Group, which is dominated by a 14-meter pyramid, played the role of a ritual center. The Northern and Western groups, apparently, had an administrative and residential character. The occupation of El Encanto goes back to the Middle Preclassic; the construction of the South Group started in the Late Preclassic or Protoclassic. The latest levels are dated to the Late Classic. We suggest that El Encanto should not be regarded as a "minor center", but as a middle-level urban community within Tikal periphery.

Vepretskii, Sergei [223] see Helmke, Christophe

Verbaas, Annemiek [199] see van Gijn, Annelou

Vernon, Kenneth (University of Utah), Kate Magargal (University of Utah), D. Craig Young (Far Western Anthropological Research Group), David Zeanah (California State University, Sacramento) and Brian Coddington (University of Utah)
[195]

Explaining Paleoindian Settlement in the Intermountain West: A Marked Point Process Approach

What explains Paleoindian (or Prearchaic) settlement patterns? Answering this question matters because it allows archaeologists to infer the drivers of colonization, mobility, and subsistence. Unfortunately, important proxies like spatial site patterning merely approximate the actual distribution of settlement behavior. This is owing not only to taphonomic decay, but also to lingering survey and statistical shortcomings, including imperfect detection, small samples, and presence-only observations. In principle, these fall under the same concept of statistical thinning, whereby some subset of the true distribution is removed from analysis, thus increasing the potential for spatial sampling bias. To address that bias and reliably evaluate hypotheses regarding the ecological motivations for Paleoindian settlement, we explore recent advances in the allied field of ecology, which faces structurally similar challenges. Specifically, we propose a multicomponent (or marked) Poisson point process modeling approach, drawing on the high-resolution distribution of Paleoindian sites in Grass Valley, Nevada.

Vestuto, Matthew [160] see Hoppa, Kristin

Vetrisano, Lucas (University of Buenos Aires)
[232]

Blade Production in Southern Patagonia, Argentina: A Comparison between Cases from the Chico and Santa Cruz River Basins

Evidence for blade production has been found in the Santa Cruz River Basin, with chronologies between ca. 1900 and 1100 years BP. Although in all the cases the blade component is limited to a small percentage of the total assemblage, it shows all the technological characteristics of proper laminar reduction methods in regard to the shaping of the cores, preparation of the flaking platform and the systematic extraction of blades, often used as blanks for retouched tools. Despite the similarities, there are also an important degree of variability in their frequency, as well as in the characteristics of the blades and cores produced. In this paper we will compare our findings from the Santa Cruz River Basin with surface assemblages from the Chico River, to the North. The area is close to sites which provided evidences of blade technology, mainly dated between 9500 and 4500 years BP. The two areas compared are very different in environmental terms with variations in lithic raw materials, rock shelters and water availability. The comparison of the artifacts allows us to assess the variability between the different cases of blade production in the region and to assign a possible chronology to the surface recollections.

Vetrisano, Lucas [198] see Franco, Nora

Vianello, Andrea (University of South Florida)
[118]

Discussant

Vianello, Andrea (University of South Florida) and Robert Tykot (University of South Florida)
[159]

Mobility Patterns in Early Medieval Northeastern Italy: Results of Strontium and Oxygen Isotope Analyses

The study of skeletal materials from the region between Ravenna, capital of the Empires and Kingdoms in the fourth–eighth centuries AD, and the Venetian lagoon had previously neglected migration and mobility approaches outside Ravenna itself, despite the high mobility expected for that time. In this study, strontium isotope analysis by multi-collector ICP mass spectrometry was done on teeth and bones of 100 individuals from 8 sites dating from the sixth–seventh centuries AD to determine the approximate percentage of individuals born outside the investigated area, whether there is a pattern based on sex, and how many geographic areas are represented. We use a database of existing analyses of animals and soils and our analyses of local water and plants for

comparison to determine foreign individuals, who may have come from across the Alps. Strontium isotopes are combined with oxygen isotopes for some individuals to strengthen our ability to recognize mobility patterns. The burials encompass different sectors of the society, from a crucifixion to a jeweled lady. The sampling of small cemeteries across a broader area instead of sampling individuals at one site is valuable in providing a robust perspective of mobility in the region during the early Medieval period.

Vianello, Andrea [199] see Tykot, Robert

Vidal-Guzmán, Cuauhtémoc (George Washington University), Alexis Clark (Advisory Council on Historic Preservation) and Jeffrey Blomster (George Washington University)
[189]

Ceramics for a "New Sunrise": Contextualizing a Mixtec Non-Polychrome Ware

While the Mixtec region of Oaxaca, Mexico is famous for its polychrome ceramics, including the iconographically rich "codex style" pottery, we argue that non-polychrome ceramics also played a significant role in conveying particular messages associated with ongoing social and political re-articulations during the Postclassic period (900–1521 AD). As new social orders were being established in the aftermath of the political collapse of numerous Classic period polities, so did the means that promoted and strengthened them. Similar to the better-known Mixtec polychrome ceramics, painted bichrome serving vessels also bore complex decorative motifs. We focus primarily on a particular type called Yanhuítlan Red on Cream, a ware found throughout the entire region in both elite and commoner contexts, with a large sample recently excavated at two middens in the site of Etlatongo, in the Nochtitlán Valley. We propose that Yanhuítlan Red on Cream ceramics communicated through its iconography an ideology directly linked with newly emergent forms of political power that suggested a new beginning, a new sunrise or creation in which humans could practice agriculture due to the originary covenant with Earth and Rain forged by elites.

Vilar, Miguel (National Geographic), Frank Camacho (University of Guam), Gregory Vilshansky (National Geographic Society), Koji Lum (Binghamton University) and Theodore Schurr (University of Pennsylvania)
[100]

New Insights into the History of Guam from Genomic Data

Guam is the largest and most populated island of Micronesia. Archaeological and linguistic evidences suggest Guam and the Marianas were settled 3,600 years before present (ybp) from Island Southeast Asia (ISEA). Guam was also the first Pacific island encountered by Europeans, later colonized for three centuries by Spain, and a stopping-point in the Acapulco-Manila galleon trade. In 1898 Guam was annexed by USA. To infer origins of Guamanians and the impact of historical circumstances on islanders, we analyzed 130,000 autosomal, Y chromosome, and mitochondrial (mt) DNA markers from 68 Guamanians. DNAs were compared to those from ISEA, neighboring Pacific islands, and a database of global populations. Results reveal that 92% of Guamanians belonged to mtDNA haplogroup E from ISEA, yet rare in Oceania, whereas 8% belonged to a unique branch of a Pacific haplogroup. Paternal (Y DNA) lineages showed ties to Indonesia and the Philippines (84%) and 16% were European. Autosomal DNA was a mix of Southeast Asian (76%), European (18%), and Amerindian (4%). That detail, though unexpected, is likely a product of the connection to Mexico during Spanish colonization. Historical records detail dozens of Spanish galleons docking, and wrecking, in the Marianas between the sixteenth and nineteenth centuries.

Vilar, Miguel (National Geographic)

[173]

Discussant

Villalpando, Elisa [240] see Carpenter, Michelle

Villalpando, Elisa [79] see McGuire, Randall

Villalva, Daniela

[266]

An Interdisciplinary Proposal for the Study of Sound and Music in Moche Art: The Case of the Afterlife/Underworld Dances (Dance of the Dead)

In Moche art, sound and music can be found in a variety of supports, from sculptured bottles to the notorious fine line paintings. Sound instruments, musicians and musical performances are spread in many of the major themes and narratives displayed in worldwide museums and discussed by scholars in the last four decades. One of these narratives is the Afterlife/Underworld Dances, where skeletons dance and play flutes in the world of the dead (hurin in the Andean ontologies). Morphological and iconographic variations in the sample led us to establish five different subthemes, which can indicate chronological and regional idiosyncrasies in the production and distribution of this theme amongst the different valleys of the Peruvian northern coast in the Moche era. Proposing a methodological approach based on the convergence of visual semantics and ethnomusicological data, ontological aspects of Moche sound production will be discussed, like the roles of flutes in rites of passage to the afterlife.

Villareal, Alessandra (University of Texas, San Antonio)

[158]

Middle Preclassic Ceramic Distribution in Western Belize: A Comparative Study from Early Xunantunich

The value of ceramic sherds and vessels to the archaeologist extends far beyond the chronology of a site. Ceramic production and distribution data, for example, reveal information about ancient lifeways, ideologies, and movement across a landscape, ultimately

telling us more about the people behind the pottery. In this paper, I will discuss the methods that archaeologists use to track ancient ceramic production and distribution—including formal and typological analyses, as well as mineralogical and compositional testing. A case study from the Mopan river valley in western Belize compares ceramic assemblages from the hinterland site of San Lorenzo and the ritual center of Early Xunantunich to build an understanding of how ceramics are differentially produced and distributed across these two contexts. The goal of this study is to highlight the social, ritual, and economic relationships between the sites that are materialized in the ceramic assemblages. Further comparison to assemblages from the sites of Cahal Pech and Barton Ramie, both situated west along the Belize River, reveals broader regional patterns of distribution, suggesting that, while Early Xunantunich maintained a relationship with these sites, they also produced their own variety of ceramics.

Villasana, Isabell [205] see James, Nathaniel

Villasenor Iribre, Eunice (Arizona State University) and Christopher Morehart (Arizona State University)

[269]

Landscape Modification and Agricultural Production on Cerro Ahumada, Mexico

Studying agricultural productivity and intensification elucidates the behavioral and demographic patterns of past societies. By understanding how physical environments were modified for agricultural use, it is possible to determine key economic and social processes. This paper presents the results of the analysis of terraces associated with the Epiclassic period (ca. 600–900 CE) site of Los Mogotes, located on Cerro Ahumada between the northern Basin of Mexico and the southern Mezquital valley of central Mexico. We created GIS maps of terraces to determine their distribution. We have also produced estimates for the agricultural productivity of terraces, which sheds light on several important economic, political, and demographic characteristics. Finally, we integrate excavation data with ethnographic data on terraces to better ascertain other important functional and technological attributes of the terraces.

Villaverde, Valentín [162] see Cabanes, Dan

Villegas, Gabriel [106] see Matsumoto, Go

Vilshansky, Gregory [100] see Vilar, Miguel

Vincent, Brice [205] see Little, Nicole

Vining, Benjamin (University of Arkansas, Fayetteville), Daniel Contreras (University of Florida) and Aubrey Hillman (University of Louisiana, Lafayette)

[125]

The Organization and Scale of Agroecological Networks in Arid Environments of Coastal Peru as Risk Factors during Abrupt Climatic Shifts

Extensive archaeological survey in the coastal portions of Peru's Chicama Valley demonstrates that multiple agroecological strategies were utilized during the prehispanic period. Even coarse-resolution chronological reconstructions suggest these developed under varying climatic regimes, and this diversity may hold clues to mitigating or anticipating the impacts of future climatic variability on agriculture. Here, we reanalyze published data on archaeological settlement distributions and palaeoclimatic conditions within a geospatial framework to examine how variations in hydroclimate and landcover presented both risks and potential opportunities for inhabitants of the Chicama Valley. We focus in particular on questions of how the scale, organization, and strategies of agroecological networks conditioned responses to climate variations. We use remote sensing to estimate how vegetation and ground/surface water dynamics responded to past climatic regimes, and through analysis of site catchments we assess the commitments of each site to different agricultural strategies. Scaling this analysis up enables assessment of the varying commitments of networks of contemporary sites and thus diachronic assessments of vulnerability. This approach is scalable in space and amendable as improved archaeological and paleoclimate data become available, and through it we ultimately can better understand how organizational mechanisms may contribute to vulnerability and resilience to climatic changes.

Vining, Benjamin (University of Arkansas, Fayetteville)

[220]

Discussant

Vining, Benjamin [59] see Contreras, Daniel

Vint, James (Desert Archaeology Inc.)

[24]

Stratigraphy and Chronology at Las Capas, an Early Agricultural Period Site in the Tucson Basin

This paper discusses the stratigraphic chronology for the Las Capas site in the Tucson Basin, southern Arizona. Las Capas was inhabited by early farmers during the Late Archaic/Early Agricultural period (EAP), which dates from ca. 2100 cal BC to cal AD 50. Maize and canal irrigation were introduced during this interval; settlement shifted from mobile hunting and foraging lifeways to a more sedentary farming-based economy. Extensive excavations at Las Capas documented occupations within five distinct

floodplain strata. Cultural features included dozens of pithouses, thousands of pits, human and canine inhumations, and canal-irrigated field systems. OxCal is used to model the site's chronology based on the stratigraphy, which is dated by 78 AMS radiocarbon and 3 OSL ages. The model divides EAP phases into relatively short intervals that provide the opportunity to study change through time within otherwise monolithic culture-historical phases 400 or more years in duration. Over two dozen other EAP sites have been excavated in the Tucson Basin, and more than 200 radiocarbon samples analyzed. The work at Las Capas and evaluation of data from these sites indicate it is possible to model contemporaneity of EAP settlements in the Tucson Basin, and refine the regional chronology in general.

Viola, Tony, IV, Corey Knox (University of Arizona) and Sara P. Chavarria (University of Arizona)

[184]

Experiential Archaeology Programming for Youth: An Evaluation

Linking Southwest Heritage Through Archaeology (LSWHTA) is an experiential youth archaeology program, run in partnership between the National Park Service (NPS) and the University of Arizona (UA). Using archaeology as a tool, LSWHTA works with local Latinx and Indigenous identifying high school students to engage with and explore various NPS locations and other cultural and archaeological sites in Arizona. Students also participate in an archaeological field school, visit laboratories and interact with archaeologists and scientists at the University of Arizona. Students who come from communities of historically low engagement or exclusion from such spaces are able to learn about the rich cultures and people of the Southwest, in addition to being exposed to potential fields of study or employment within the NPS and archaeology. This poster centers the voices and experiences of 13 Latinx and Indigenous students through a presentation of results from a goals-based evaluation of the LSWHTA program. Thirteen student-produced multimodal products were analyzed to identify the core components of LSWHTA and the unique perspectives of the participants. This study explored the fit between the program's preexisting framework as well as identified additional themes based on students' reflections.

Viola, Tony, IV [184] see Molinares, Stephen

Viskanta Khokhriakova, Sandra, Alexandre Tokovinine (University of Alabama), Dmitri Beliaev (Russian State University for the Humanities) and Sandra Balanzario Granados (INAH, Mexico)

[223]

Nuevos datos, nuevas interpretaciones: Resultados preliminares de escaneo 3D y fotogrametría de algunos rasgos, monumentos y artefactos de Dzibanché

This paper presents some preliminary results of the first field season of 3D documentation of buildings, monuments, and portable artifacts from the archaeological site of Dzibanché in Quintana Roo, Mexico. Four building facades, twenty stairway blocks, nine miscellaneous sculpture fragments, and six ceramic vessels were digitized with a structured-light system and/or structure-from-motion photogrammetry. Documentation took place at Dzibanché, in the INAH regional research center in Chetumal, and in the Maya Museum of Cancun. Part of the resultant corpus of imagery and inscriptions has not been previously disseminated in academic literature. The analysis of published texts and iconography has benefited from higher resolution and visualization tools made possible by 3D digitization. The presentation proposes several updates to the published interpretations of Dzibanché monuments and highlights how new additions to the corpus expand our understanding of its political history and ideology.

Vivian, R. Gwinn [98] see Fladd, Samantha

Vlok, Melandri, Erdene Myagmar (National University of Mongolia) and Hallie Buckley (University of Otago)

[62]

Nutritional and Infectious Diseases in the Bronze and Iron Ages of Mongolia: The Archaeological Significance

The identification of nutritional and infectious diseases in human skeletal assemblages has value for both bioarchaeologists and archaeologists for assessing the impact of particular biosocial and environmental contexts on health. We present skeletal evidence for the nutritional diseases rickets, osteomalacia, and scurvy (Vitamin D and C deficiency) and infectious diseases including possible brucellosis, tuberculosis, echinococcosis, and treponematoses in Bronze (~2500–400 BCE) and Iron Age Xiongnu (200 BC–100 CE) human skeletal assemblages from Mongolia. The presence of these diseases in these contexts indicate considerable social change between the Bronze Age and Xiongnu, affecting the health of these populations. High rates of rickets and osteomalacia were found in both assemblages, whereas an increased presence of scurvy was identified in the Xiongnu. There is little increase in the prevalence of infectious diseases between the Bronze Age and the Xiongnu (3.3% compared to 5.9%). However, the diversity of different diseases increases from the Bronze Age to the Xiongnu which may reflect the impacts of increasing migration and trade introducing new diseases. The presence of zoonotic infectious diseases in both assemblages highlight the intimate relationship between pastoralists and their herds from the Bronze Age onward, supporting the idea of intensifying pastoralism at this time.

Vokes, Arthur [172] see MacFarland, Kathryn

Volta, Beniamino (HDR Inc., and University of California, San Diego) and Nancy Peniche May (Instituto Nacional de Antropología e Historia)

[197]

Reconstructing the Political Strategies of Middle Preclassic Elites in the Northwestern Maya Lowlands: The View from Hobonyá

Recent research has upended long-held assumptions about the emergence of social complexity in the Northern Maya Lowlands, once considered a marginal zone into which social innovations diffused from the Petén heartland. The dry northwestern corner of

the Yucatán peninsula was home to at least 100 communities with Middle Preclassic (1000–300 BC) occupations, forming a surprisingly dense three-tiered settlement system. These sites contained monumental public buildings, plazas, ball courts, and causeways, and displayed significant variability in the size and elaboration of residential structures. The distribution of architectural features across sites, however, does not lend itself easily to interpretation. Structures and arrangements usually associated with ritual or political functions are found at both large, complex centers and at smaller second- and third-rank sites lacking evidence of social inequality. Other sites lack any kind of monumental public architecture at all, but their considerable spatial extent suggests that they were important communities. It is currently unclear whether this settlement system was headed by one or more primate centers. Based on preliminary field observations from Hobonyá, a probable late Middle Preclassic regional center, we discuss the implications of architectural patterns and settlement data for reconstructing the political strategies employed by emerging elites during this crucial period.

Voorhies, Barbara (University of California, Santa Barbara), C. Fred Andrus (University of Alabama), Christine Bassett (University of Alabama) and Holley Moyes (University of California, Merced)

[237]

Determination of Ritual Seasonality at a Prehistoric Maya Shrine: Preliminary Results

An exceptionally well-preserved shrine complex at the rear of the Entrance Chamber in the Las Cuevas Maya cave provides a unique opportunity to address research questions usually beyond investigators' reach. Post-abandonment flooding buried this location so well that architectural features and cultural objects remain undisturbed. The structure and contents of the shrine complex meet archaeological expectations for a ritual location, and robust analogies occur with ethnoarchaeologically known ritual locations in the Maya Highlands. We suspect that activity at this shrine involved petitions for rain, perhaps similar to the rain rituals of present-day traditional Maya farmers. If correct, ritual activity should occur only during the transitional period from dry to wet season. To determine ancient ritual seasonality, we use as proxies isotopic signatures of freshwater snail shells that prehistoric Maya worshippers left as offerings. The oxygen isotope profiles of these shells appear predominantly influenced by variations in precipitation. For the hypothesis to be supported, the oxygen isotope shell profiles should show that season of snail capture coincides with the onset of, or just prior to, the rainy season.

Vorderstrasse, Tasha (University of Chicago)

[261]

Approaches to Bactria in Late Antiquity

This paper will look at the different sources for Bactria in Late Antiquity and assess how these can help us understand the transition to Islamic rule in the region. While archaeological investigations on the ground have been necessarily limited by the political situation in Afghanistan, satellite imagery also provides valuable evidence for the archaeology of the region. There are also documents, written in Bactrian and Arabic, which have been discovered in the region and help demonstrate how Bactria fits into the wider Islamic world. Further, sources for Bactrians outside of Bactria, such as the Nestorian inscription from Xian in China, can also provide information about the Bactrian population. Finally, this material can be examined with the historical sources and accounts of travelers to the region to better understand not only what we know about Bactria but also the significance of these accounts when compared to the archaeological evidence.

Vranich, Alexei [127] see Ogburn, Dennis

Vujevic, Dario [85] see Zaro, Gregory

Vyazov, Leonid [173] see Flegontov, Pavel

Vyhmeister, Joy

[247]

The Games They Played: Material Culture Highlights from a Historic Period Site in Downtown Redlands, California

Excavations at a historic period site in downtown Redlands have produced a large number of household artifacts dating to the nineteenth and twentieth centuries, including a significant number of items associated with play and leisure time. These objects give us the chance to explore the value of play, and to examine variations in personal and cultural behaviors both through time and across cultural divides. This presentation looks at the variety of more commonly identified toys and games (dolls, marbles, gaming pieces), and highlights some of the more unique pieces of material culture that would fall through the cracks in a study that only looked at functional items. It compares and contrasts the kinds of treasured items found in portions of the site representing Chinatown and a Mexican barrio, and the implied differences in household behavior and cultural values. Most of the items, with the notable exception of Chinese gaming pieces, likely belonged to children, but some are clear examples of how personal expression and play continue into adulthood.

Wade, Angela [184] see Tullo, Dominic

Wade, Lizzie

[70]

Discussant

Wade, Mariah**[108]***Glass: Breathing into Matter*

Blowing into molten glass gave it form, a breathtaking invention of the first century BCE. Before that, glass vessels were made using the core-forming technique and by casting, which were more expensive and less efficient methods. Glass blowing enabled the play of forms and color while making glass vessels more accessible to a wider market. This paper explores the mechanical and sensorial properties of glass, the relationship between container and content, the dichotomy between the production of exquisite forms and increased availability and how all those relate to the behavior of makers and consumers.

[108]*Chair*

Wadley, Lyn [11] see Bader, Gregor

Wadsworth, William [202] see Supernant, Kisha

Wagner, Dustin [136] see Arakawa, Fumi

Wagner, Dustin [122] see Cron, Lindsey

Wagner, Logan (ALARIFE)**[145]***Discussant***Wagner, Mark and Mary McCorvie (Shawnee National Forest)****[269]***The "Place Where No One Ever Goes": The Landscape Archaeology of the Miller Grove Community*

The freed slave African-American inhabitants of the pre-Civil War Miller Grove community in southeastern Illinois lived within a dynamic landscape of interlocking natural and cultural features that expressed their identity as a free people as well as their resistance to slavery through covert participation in the Underground Railroad. Bluffs and caves became symbols of resistance through their association with the Underground Railroad as did a school house where the community children learned to read and write, activities that had been forbidden to their parents. Earthen paths linked the farmsteads comprising the community into a unified whole while also providing access to socially significant aspects of the built environment such as a communal cemetery and church/school. This paper explores these and other topics through an examination of the distribution of cultural and natural features across the Miller Grove landscape, the spatial organization of the community, the archaeology of selected households within that community, and the trail system that joined the community together. Artifacts recovered from the Miller Grove households indicate participation within the larger Euro-American regional economy but also possible resistance to the pro-slavery sentiments of their Upland South white neighbors.

Wagner, Stephen (Bison Historical Services Ltd.)**[95]***Discussant***Wagner, Stephen (Bison Historical Services Ltd.)****[183]***Managing a Data Hotel: An Artifact Catalog Database at a CRM Firm*

Databases are often presented as being used as homes for archaeological data. In the CRM industry, private sector firms rarely require long term storage of data as these duties are usually fulfilled by government agencies. Instead, data housing needs are focused on a short term basis, conducted while data is transmogrified through analysis from field collection into a reporting format. These data are then exported into the required format for curation. This presentation uses an artifact catalog database, developed by Bison Historical Services Ltd., in order to illustrate the benefits of shifting from a spreadsheet-based cataloguing system. The system increased the efficiency of recording by a large margin, however unexpected logistical constraints also became a factor. Additionally, although the cataloguing process used in the database development was originally intended to be a continuation of extant cataloging processes, the shift in recording medium resulted in changes to the actual process.

[183]*Chair*

Wagner, Ursula [5] see MacDonald, Brandi

Wagoner, Ashlyn [122] see Cron, Lindsey

Waite, Danielle (University of Central Florida), Travis Stanton (University of California Riverside), Traci Ardren (University of Miami) and Brigitte Kovacevich (University of Central Florida)

[5]

Household Economies in Light of Socioeconomic Integration: Sourcing Analysis of Obsidian Artifacts from Coba, Quintana Roo, and Yaxuna, Yucatán, Mexico

During the Late to Terminal Classic periods (AD 730–1000), the Maya state of Coba was the capital of the largest polity, and perhaps most important political power, in the northern lowlands. During this period, Coba experienced substantial population growth, unprecedented construction of monumental architecture, and most notably, the creation of an extensive causeway (sacbe) program. These causeways served to physically integrate numerous nearby communities into Coba's sphere of influence, including the site of Yaxuna, approximately 100 km to the west. While clear power differences between the two sites is evident, how this relationship impacted households and their associated economies at Coba is poorly understood. In order to understand these impacts, this research investigated how the consumption of obsidian changed in light of the altered social and economic integration of these two ancient Maya polities. Sourcing analysis through the use of Handheld XRF (X-Ray fluorescence) was utilized to identify differences in the patterns of obsidian consumption between households at Coba and Yaxuna. The results suggest Coba maintained a strong influence on the domestic economic strategies of resource exploitation during this period, indicating the construction of the Yaxuna-Coba causeway spurred change in local domestic economies.

Walden, John (University of Pittsburgh)

[155]

Moderator

Walden, John [178] see Ellis, Olivia

Walden, John [230] see Hoggarth, Julie

Walden, John [169] see Izzo, Victoria

Walden, John [178] see Messinger, Emma

Waldo, Brian (California State University, Los Angeles)

[137]

A GIS Approach to Assess the Water Resources at Chichen Itza

Water has long been recognized as a critical but scarce resource in Yucatán. Settlement tends to be determined by the presence of cenotes and habitation clusters around these water features. Water resources have not received a great deal of attention at Chichen Itza because of the simplistic notion that the Cenote Xtoloc was the site's water source while offerings were made to the Sacred Cenote. Even the most cursory examination makes it clear that these two water sources could not have supported a city the size and complexity of Chichen Itza. Geographical Information Systems (GIS) have been a potent tool in documenting resources across city-scapes. Coupling GIS with pedestrian survey, this paper is a preliminary attempt to identify and illustrate a far ampler view of the waterscape within Chichen Itza's city limits.

Waldrip, Ashley [179] see Hard, Robert

Walker, Chester [192] see Pantel, Agamemnon

Walker, Chet [21] see Conlee, Christina

Walker, John [4] see Young, Danielle

Walker, Karen [59] see Lulewicz, Isabelle

Walker, Karen [146] see Miller, Sarah

Walker, William (New Mexico State University) and Judy Berryman (New Mexico State University)

[122]

Ritual Closure: A Countermeasure to Witchcraft

Archaeologists routinely encounter ceremonially closed buildings and sites yet specific explanations about why this occurs and how to frame it remain murky. For the American Southwest and likely many other parts of the world fear of witchcraft may explain these closures. We argue in this poster that ritual burning and the inclusion of materials in the deposits of closed pueblo villages counteracted potential dangers of things falling into the wrong hands. Among southwestern peoples ashes serve as an antidote and prophylactic against spiritually dangerous powers. Similar powers reside in projectile points. Indeed, in the southwest the agency of many objects such as shell, turquoise, fossils, and crystals likely conditioned their inclusion in closure deposits. We conceptualize these additions as a form of temper used in a ritual technology to process the closure of Cottonwood spring Pueblo, a large El Paso phase (AD 1300–1450) village on the western flanks of the San Andres mountains of southern New Mexico.

Walker, William [136] see Corl, Kristin

Wall, Peggy**[179]***Using Summed Probability Distributions to Develop Expectations of Mobility in Bexar County, Texas*

Radiocarbon (¹⁴C) dating at the Chandler site (41BX708) in northwest Bexar County, Texas, shows evidence of intermittent site use from over 10,000 BP. Summed probability distributions of radiocarbon dates from Central Texas are used to develop expectations of changing residential and logistical mobility patterns of ancient hunter-gatherer groups from the Late Paleoindian period through the Archaic, and into the Late Prehistoric periods. These changes can be associated with population growth and decline as well as adaptations to local environments over time.

Wallace, Rod [124] see Ladefoged, Thegn

Waller, Steven (Rock Art Acoustics)**[25]***Archaeoacoustic Studies of Rock Art: Who, What, When, Where, Why, and How?*

Cases studies are presented supporting the archaeoacoustic theory that sound was an important factor for rock art site selection and subject matter. Sound phenomena were spiritually significant to pre-scientific cultures mystified by echoes. Yet modern investigators have only recently begun using acoustic techniques to study rock art. Examples are given of mythical descriptions of echo and thunder spirits that match major visual motifs in rock art up to 30,000+ years old. Remarkable acoustics were found at hundreds of rock art sites on three continents, from European deep caves and open air sites (Lascaux, Niaux, Cougnac, El Castillo, Valltorta, Valcamonica, Coa...), to American Southwest canyons and cliffs (Horseshoe, Hieroglyphic, Back, Little Lake, Oiseau...), to Australian rock shelters (Flying Fox, Red Lady, Giant Wallaroo...). Quantitative methodology is discussed; results are presented from systematic surveys at specific sites, which demonstrate that decorated panels emanate louder echoes than non-decorated surfaces within particular canyons and caves. These investigations aid in understanding our ancestors' motivations for producing rock art, and reveal a need for conservation of natural soundscapes of rock art sites. These results suggest the use of sound reflection in ancient ritual practices for communicating with the spirits believed responsible for echoes and thunderous reverberation.

Waller, Joseph (Jay), Jr. (PAL)**[12]***Home Is Where the Hearth Is: Narragansett Indian Houses and Homes on the Eve of European Contact*

Site RI 110 on the southern Rhode Island coast has yielded evidence of a large Narragansett Indian settlement occupied between AD 1000 and 1500. Archaeological investigations exposed more than 20 individual wetus (houses) or other structures concentrated within an approximate 0.81 ha (2 acre) portion of the larger site. This presentation will describe Narragansett Indian house construction, intrasite house patterning, and variability in house size, shape, and the use of domestic space (home) at the site. The results provide new information on Narragansett Indian life during the decades and centuries leading up to first European Contact.

Walling, Stanley (Community College of Philadelphia), Jonathan Hanna (Pennsylvania State University), Christine Taylor (Rio Bravo Archaeological Survey) and Shawna Veach (Google Corporation)**[53]***Intra- and Intersite Commoner Ritual in the Rio Bravo Basin, Northwestern Belize*

The Rio Bravo Archaeological Survey has carried out field investigations at several Late Classic Maya commoner sites in the Rio Bravo Conservation and Management area of northwestern Belize. This paper will focus on recent evidence from the site of Chawak But'o'ob and nearby ancient communities, where a commoner ball court, landscape modification and manipulation of natural hydrology provide evidence for ancient intrasite and intersite ritual.

Walling, Stanley [230] see Coughenour, Chance

Wallis, Neill (Florida Museum of Natural History) and Thomas Pluckhahn (University of South Florida)**[29]***Understanding Multi-Sited Woodland Communities of the American Southeast through Categorical Identities and Relational Connections*

While communities are often considered to be isomorphic with settlements, this equivalency is ill-suited to understanding contexts in which the structure of settlement and social organization was cyclical and nested at multiple spatial and temporal scales. In the coastal plain of the American Southeast, most Middle Woodland (ca. 500 CE) settlements comprised only a few households, but they were integrated by interactions and institutions that spanned many localities and included large civic-ceremonial centers. Overlapping communities included kin-based segments, non-kin institutions such as sodalities, and various regional affiliations. These communities were constituted by shared identities, interconnected economies, integrative practices such as mound building and feasting, networks of regular social interaction, and associations with particular places. We investigate the intersections of communities at various scales by comparing categorical identities—affiliations proxied by the relative frequency of pottery surface treatments—with relational connections defined by face-to-face interactions between sites. The latter are evidenced by sourcing data and paddle matches on complicated stamped pottery that reveal earthenware vessels or carved wooden paddles were carried between sites. Using social network analysis we explore the spatial boundaries of distinctive categorical identities among sites and evaluate their correlation with the frequency and distance of evident relational connections.

Wallis, Neill [123] see Duke, C. Trevor

Wallis, Neill [80] see Williamson, Kylie

Wallman, Diane (University of South Florida), Douglas Armstrong (Syracuse University), Mark Hauser (Northwestern University), Kenneth Kelly (University of South Carolina) and Lennox Honychurch
[239]

Archaeological Research of Indigenous-European Interaction at La Soye 2, Dominica

In 2017, storm surges from Hurricane Maria exposed evidence of an early European colonial settlement on the Caribbean island nation of Dominica. Subsequent survey and testing established the site as a trading factory, dating from the sixteenth to eighteenth century, a period of dynamic change in the Caribbean. The site of La Soye 2 is located on the coastline of an active trading channel between Marie-Galant, Guadeloupe and Dominica, protected by a headland called Point La Soye. Behind this point is the first sheltered anchorage for vessels voyaging from Africa and Europe, and territory of indigenous Kalinago groups. Two seasons of archaeological testing at the site have recovered indigenous "Cayo" and imported European ceramic wares, syncretic artifact forms, trade items, faunal remains and more, indicating complex interactions between indigenous groups and the European traders. Evidence for the active role of indigenous communities in trading and economic activities are documented through the material culture and features within the settlement. This site offers a rare opportunity to examine the consequences of informal European colonialism on the Caribbean frontier.

Walsh-Haney, Heather [18] see Duggins, Ryan

Walsh-Haney, Heather [188] see Elgart, Alison

Walter, Richard and Andy Cloud (Center for Big Bend Studies, Sul Ross State Univ.)

[40]

Excavations at the Genevieve Lykes Duncan Site: Exploring the Character of Late Paleoindian Deposits in the Big Bend Region of the Chihuahuan Desert

Investigations at the Genevieve Lykes Duncan (GLD) site have uncovered a range of data on Late Paleoindians and their lifeways in the Texas Big Bend. With exceptionally intact thermal features and cultural residue dating from ca. 11,000 to 8500 BP, the site is helping to rewrite our understanding of this little known period in the region. Excavations at GLD by the Center for Big Bend Studies of Sul Ross State University, beginning in 2010, have uncovered an array of data about these early regional inhabitants and the environment they lived in, including attributes of early earth ovens, information on chipped-stone and ground stone assemblages, economic pursuits, and the paleoenvironment. More importantly, this paper highlights that plant processing was a significant component within a generalized foraging strategy during the Early Holocene in the eastern Trans-Pecos/Big Bend region.

[40]

Chair

Walter, Richard [40] see Hart, Thomas

Walz, Jonathan [249] see Sarathi, Akshay

Wang, Chunxue (Jilin University), Dong ei (Jilin University), Huiqiu Shao (Jilin University) and Jiaqi Wang (Jilin University)
[212]

Preliminary Study on Animal Bone Remains Discovered at Sanjianfang Site in Loulan Ancient City, Xinjiang, China

A integrated investigation in Lop Nur was carried out by Institute of Geology and Geophysics, Chinese Academy of Geosciences, Institute of Remote Sensing and Digital Earth and Xinjiang Institute of Ecology and Geography, Chinese Academy of Science, Xinjiang Institute of Cultural Relics and Archaeology, School of Archaeology in Jilin University in 2014. We have carried out small-scale excavation of the Sanjianfang Site in Loulan Ancient City and obtained a large number of animal skeletons. This paper mainly discusses the living environment, living mode and eating habits of the ancestors in Loulan city by means of species identification, anatomical location identification and observation of skeletal surface traces. Based on the ecological characteristics of animal groups, the number of cattle, sheep, camels, horses and other animals should be considerable, indicating that the water and food resources at that time were more than enough to meet the daily needs of human and livestock. That is to say, the ecological environment at that time was better than that at present. The Tarim River was rich in water resources, and the coverage rate of natural vegetation was higher. The resulting nomadic industry also provided more adequate food resources for the local people's lives.

Wang, Chunxue [162] see Wang, Jiaqi

Wang, Chunxue [36] see Wei, Tianxu

Wang, Jiajing

[45]

Grinding Stones and Human Domestication

In East Asia, the innovation of grinding stones enabled humans to exploit a diversified array of plant resources. First invented by late Pleistocene hunter-gatherers, these tools were used at a relatively small scale, but from the beginning of Holocene they were increasingly common, becoming a ubiquitous and dominant technology. The intensified production of grinding stones has often been interpreted as a result of demand for processing domesticable plants during the Neolithic transition. Drawing on recent data from residue analysis, this paper shows that early grinding stones were predominately used for processing wild foods. At the same time,

the active agencies of grinding stones physically and culturally “domesticated” humans, creating an irreversible reliance on technologies and trapping them into a sedentary life.

Wang, Jiaqi (Jilin University), Chunxue Wang (Jilin University) and Lishuang Sheng (Protection Center of Cultural Heritage in Tianjin)

[162]

A Preliminary Report on Excavations at Locality 2 of Chaoyangdong Site in North China

The Chaoyangdong Site is located in Tianjin City, north China. It was first found in 2015 and was excavated from June to September, 2019. Chaoyangdong Site includes two cave sites, which are Locality 1 and Locality 2. This paper is a preliminary report of the excavation in Locality 2. There're 71 lithic artifacts found in Locality 2 and more than 90% of them were made of flint, which are transported materials from other sources, indicating mobility pattern changes. The types of them include tools and flakes. Chaoyangdong Site is the first cave site in Tianjin City, playing an important role in the research of Paleolithic archaeology of this area and compared with Locality 1, Locality 2 has better lithic artifacts to be analyzed, which means it is of more value.

Wang, Jiaqi [212] see Wang, Chunxue

Wang, Jiaqi [36] see Wei, Tianxu

Wang, Li-ying and Ben Marwick (University of Washington)

[55]

Investigating Social Inequality Using Bayesian Inference for Network Analysis of Burials from Iron Age Northeast Taiwan

Prestige goods among burials may reflect social relations between individuals and allow us to infer social structures. We study whether European colonial activities in seventeenth century Taiwan resulted in increasing social inequality in an indigenous society using social network analysis (SNA). Do the observed burial data indicate a more clustered network than a distribution of random networks with similar qualities? Exponential random graph models (ERGMs) are important models for analyzing network data and evaluating its structure. However, ERGMs are difficult to compute because their normalizing constant, which depends on model parameters, is intractable. A Bayesian framework allows for parameter inference using MCMC strategies, which avoids the need for computationally intensive calculations of the normalizing constants. We use Bayesian SNA to study burials from an Iron Age site in northeast Taiwan. We expect the network to present a higher degree of clustering (e.g., the number of completed triangles) in the European contact period that might hint at social heterogeneity. This study helps to expand the use of burials in understanding the indirect effects of colonial presence on indigenous groups. A Bayesian approach enables the efficient quantification for uncertainty, parametrization, and model evaluation of social network metrics.

Wang, Li-ying

[139]

Discussant

Wann, Kevin (Murray State University) and Chris Begley (Transylvania University)

[77]

Creating Computational Scripts for Microsoft Excel and Python 2 That Determine the Exact Coordinates of a Submerged Artifact Measured through Trilateration

This study focuses on the application of software and informatics to the growing practice of underwater archaeology. One common challenge present to underwater archaeologists is the mapping of seafloor artifacts. Traditionally, submerged artifacts are measured by taking two separate measurements to a baseline with an origin of known coordinates and degree bearing. Then, archaeologists can effortlessly map the location of these artifacts by hand using a geometric compass. However, this presents a great deal of error when transcribing a hand map to a digital GIS software. This study seeks to bypass the error involved in hand-mapping by devising coding scripts that use the trigonometric law of cosines and several conditional operations to calculate the exact geographic coordinates of an artifact entirely digitally. A Microsoft Excel spreadsheet formula will allow for novices in GIS to easily read and assess the measured artifacts' coordinates, whereas a Python 2.7 script presents informatics and GIS specialists with a tool to efficiently project these coordinates as points onto a Data Frame within ArcMap 10.7.

Ward, Allegra

[63]

Historicizing the Design and Use of Log Tombs in the Ohio Valley during the Woodland Period

Since the early twentieth century Adena and Hopewell have been two of the most recognizable social units of the Eastern Woodlands. Mapping and excavations of the mounds constructed by both groups began in the mid-nineteenth century and continued steadily for a century, and while often less systematized, gathered the majority of data utilized by archaeologist today to understand the mortuary practices and traditions of these groups. Through this work, log tombs were deemed a diagnostic burial practice of Adena societies of the Early Woodland period (800 BC to AD 1), though they continued to be built and utilized by Hopewell societies during the Middle Woodland period (AD 1 to 400). To date, research has yet to fully address the diversity in the practice of log tomb construction and use, specifically if this variability aligns to broader trends in the Woodland period. In this presentation, I share the results of archival research through which I historicize the practice of log tomb construction by diachronically evaluating the relationship between construction techniques and mortuary practices to improve our understanding of the course of social complexity in the Eastern Woodlands.

Ward, Grace (Washington University, St. Louis)**[235]***People and Plants at Jaketown: A Case Study of Poverty Point-Era Landscape Management*

The people who built major earthworks at Jaketown and Poverty Point during the terminal Late Archaic lived and labored in a complex floodplain ecosystem. The past two seasons of excavation at Jaketown, located in the Yazoo Delta of west-central Mississippi, have yielded geoarchaeological and paleoethnobotanical data that speak to the complexity of both the social and ecological landscape of this section of the Lower Mississippi Valley. This presentation reports the results of preliminary paleoethnobotanical analysis, focusing on markers of human engagement with herbaceous floodplain pioneers such as chenopod (*Chenopodium berlandieri*), as well as food-producing perennials, including hickory and pecan (*Carya* spp.), and persimmon (*Diospyros virginiana*). The stratigraphy of the contexts from which flotation samples were collected indicates patterns of earthen construction and seasonal flooding, offering insight into the relationship between social and environmental history and plant life at Jaketown during the Late Archaic.

Ward, Maxwell (University of California, Santa Cruz) and Ryan Hechler (Tulane University)**[201]***A Shiny Clear Rock and a Hard Place: Obsidian Usage in Ritual Contexts in Cochasquí*

This paper focuses on the analysis of the role of the obsidian contents of a ritual floor found on top of one of the pyramids from the Late Integration Period Cochasquí monumental center in Ecuador. Obsidian contexts were derived from the ritual floor as well as the natural levels above it. Obsidian usage by the Cara people in ritual and utilitarian contexts were compared in order to see if there was a preference in obsidian between these different contexts. A variety of qualities were observed in 112 different types of obsidian to ascertain if attribute-based preference could be determined based upon context. Does obsidian within different contexts of the largest monumental construction of the site reflect preference in obsidian usage based upon context, or merely the quantity of obsidian usage in ritual and utilitarian contexts?

Ward, Naomi [244] see Ricketts, Macy

Wardle, Joseph (University of Michigan)**[194]***Variation in Anadromous Fish Migrations and the Scale of Plant Intensification in the Upper Willamette Valley, Oregon.*

Intensification of salmon, shellfish, nuts, and geophytes occurred in the Pacific Northwest of North America during the post-Pleistocene. While much of the regional research has focused on intensification of salmon, this paper explores spatial and temporal variability in intensification strategies in the Upper Willamette Valley (UWV) in Oregon. Anadromous fisheries in this region would have been characterized by greater seasonal and annual variability than those in nearby river systems. This was due to the height of Willamette Falls, an obstruction which would have influenced the abundance and predictability of fisheries above the falls. To assess one possible effect of this, the following hypothesis was proposed: UWV groups during the Late Holocene (3,000 BP to Contact Era) would have intensified plant species such as camas at a greater scale than groups in regions where there was access to more predictable, abundant fisheries. The diameter of cooking pits and frequency of fire-cracked rocks were analyzed within two regions: the UWV and the broader Columbia River Basin. The results indicated that both variables were significantly greater in the broader Columbia River Basin, suggesting that intensification of plants was not conducted at a greater scale in response to less predictable and abundant fisheries.

[194]

Chair

Warner, Jacob (Louisiana State University)**[174]***Catastrophe or Opportunity? The El Niño-Southern Oscillation and the Dusk of the Chavín Interaction Sphere in the Lower Nepeña Valley*

One of the perennial questions surrounding the decline or reorganization of societies in the past is the influence of climate and environmental change. Understanding the role of climate and environment in these scenarios requires a careful consideration of multiple lines of evidence and underlying causal mechanisms in social and natural systems. We examine the possible influence of shifts in the El Niño-Southern Oscillation (ENSO) on the dusk of the Chavín Interaction Sphere in the Nepeña Valley, Peru. We present evidence of increased ENSO variability during the local Nepeña and Samanco phases Horizon (850–150 BCE) from the geochemistry ($\delta^{18}\text{O}$ and El/Ca) of the short-lived bivalve *Donax obesulus*. This increased ENSO variability appears driven by a limited number of large El Niño events, similar to those recorded in other paleoclimate archives for the preceding Initial Period (1800–900 BCE) and part of a trend of increasing ENSO variability from the middle Holocene to modern times. Increasing ENSO variability may have played a significant role in the decision-making processes that led to the foundation of agglutinated proto-urban settlements following the Chavín influence in the lower Nepeña Valley, as strong El Niño events bring devastating flooding to the valley floor.

Warner, Mark (University of Idaho)**[89]**

Discussant

Warner, Mark (University of Idaho)**[132]***From Peale to Trimble: Communicating with Collections*

Taking care of, working with, and managing archaeological collections is frequently viewed as a relatively undifferentiated issue. The reality, however is that historical collections present a variety of challenges that are distinct from precontact materials. This paper highlights the challenges faced by people working with historical collections and it provides some summary commentary on Sonny Trimble's contribution to SHA and the organization's collections practices as well as his integral role in the establishment of the Archaeological Collections Consortium.

Wasse, Alexander [125] see Heidkamp, Blair

Watanabe, Shinya (Nanzan University, Japan)

[106]

Cultural Diversity and Its Implications: A Case Study from Middle Horizon Cajamarca, Northern Highlands of Peru

In this paper, we will discuss the pottery typology and chronology of Cajamarca Region to consider the cultural dynamics during the Middle Horizon Period. We will present the excavation data from three archaeological sites: El Palacio, Paredones, and Terlén La Bomba. During the Middle Cajamarca Phase A (C.E. 600–750) the kaolinitic ceramic of Cajamarca presents intense uniformity, but during the Middle Cajamarca Phase B and C (C.E. 750–950) this pattern changes for a more diverse fine ceramics and mortuary patterns. In order to test our hypothesis, we will consider the following points: 1) the relation between cultural diversity and political system of Wari Empire, 2) the interaction between the Cajamarca region and the north coast of Peru, and 3) the genesis of new material culture. An example of this last point is the “Coastal Cajamarca” type pottery which appeared during the Middle Horizon and continued in the Late Intermediate Period in Lambayeque region. This new style is distributed mainly along the Jequetepeque Valley, this was an important route to connect Cajamarca and the North Coast of Peru. Finally, we will discuss the transition from the Middle Horizon to the Late Intermediate Periods.

Waterman, Anna (Mount Mercy University), Bryan Kendall (University of Iowa), Andrew Somerville (Iowa State University) and Julien Royer (Iowa State University)

[78]

Stable Isotope Analysis of Faunal Remains from a Western Iowa Oneota Site: A Preliminary Investigation of Diet and Mobility in the Late Prehistoric Period of the Upper Midwest

Stable isotopic analysis can provide quantifiable data about diet and mobility patterns in humans and animals. In this study the apatite and collagen of 20 animals recovered from recent excavations of the Oneota (AD 1300–1400) Dixon site (13WD8) in western Iowa were analyzed for $\delta^{13}\text{C}$, $\delta^{15}\text{N}$ and $\delta^{18}\text{O}$ values. The results of these analyses provide valuable information about human and animal diets, mobility, and faunal procurement strategies in the Late Prehistoric period of upper midwestern North America.

Waters, Albert (Independent Researcher), John Vandergugten (University of Toronto,), Gavin Donathan (Binghamton University, U.S.), Courtney Hopper (University of Toronto,) and Genevieve Dewar (University of Toronto)

[77]

A 3D Interactive Model of Spitzkloof D Rockshelter, Namaqualand, South Africa

Archaeology is of great public interest, but a lack of approachable academic and popular materials may deter public engagement with our field and our research, meaning archaeologists must develop innovative means of communication. It is also vital that we make our work more accessible to local community members, whose history we are often excavating. Digital reproduction of archaeological sites through photogrammetry is a valuable documentary and educational tool that is easily accessible and engaging. We present photogrammetry results of the Spitzkloof D Rockshelter located in Namaqualand, South Africa, data for which was collected during the 2019 field season. Over 400 points were designated in and around the site, and their cartesian coordinates recorded using a Nikon Nivo 5M total station. The Rockshelter was then photographed using a Sony a6400 camera, and the resulting images georectified using the program Agisoft Metashape. Using this information, we generated a 3D model of the Rockshelter, the excavated units, and the immediate landscape. The ability to remotely view a relatively inaccessible site such as Spitzkloof D provides an opportunity to better present visual representations to the general public and local community members. Initiatives like these may be crucial in building and strengthening local relationships.

Waters, Gifford [123] see Sorresso, Dominique

Waters, Michael (Texas A&M University) and Thomas Stafford Jr. (Stafford Research Laboratories)

[19]

Five Decades of Research at Hall's Cave, Texas

Hall's Cave is located on the Edwards Plateau 200 km west of Austin, Texas. The cave formed in Cretaceous limestone and was exposed to the surface when a segment of the roof collapsed during the late Pleistocene. Today the cave consists of a single large room entered via a talus cone. Since the opening of the cave, 4 m of well-stratified, clastic sediments filled the cave. Over 200 radiocarbon dates on bone and charcoal provide chronological control. These sediments contain a vertebrate paleontological and environmental record spanning the last 20,000 years. Archaeological evidence shows that people first entered the cave about 10,500 cal yr BP. and continued using the cave throughout the Holocene. The paleoenvironmental records allow us to reconstruct changes in climate for the last 20,000 years and its effect on fauna and humans in this region.

[19]

Chair

Waters, Michael [19] see Linderholm, Anna
 Waters, Michael [19] see Stafford Jr., Thomas

Watkins, Joe (Archaeological and Cultural Education Consultants)

[1]

Setting the Context of Equity and Harassment Issues: They Are NOT Only Women's Issues

Social sciences within the United States, like U.S. society in general, are facing serious ramifications regarding issues related to equality and harassment. Gender equity, pay equity, and funding equity are all part of the problems being faced by professionals employed in academic, public, and private sectors. Additionally, harassment in all forms—sexual harassment, gender harassment, and “bullying,” for example—is also encountered throughout the social sciences. As is to be expected, practitioners within the discipline of archaeology are reporting these same issues. Statistics are telling, and indicate that the situation has reached a turning point. No longer can archaeologists presume to adhere to codes of conduct that relate only to responsibilities to the past, but rather archaeologists must recognize their responsibilities to each other as well. The paper outlines some actions that national and local social science organizations have undertaken in attempts to influence equity and harassment concerns as a means of setting the context for the session.

Watkins, Joe (Archaeological and Cultural Education Consultants)

[207]

Moderator

Watkins, Tia (University College London), Jaime Awe (Northern Arizona University), Claire Ebert (Northern Arizona University) and Douglas Tilden (Belize Valley Archaeological Reconnaissance Project)

[158]

Recent Chronological Developments at Xunantunich, Belize: Investigating Preclassic Architecture in the Monumental Site Core

Preclassic architecture in the Mopan River Valley provide an understanding of the earliest political developments in the region, contributing to our understanding of the development of the region's political landscape. Recent research at the hilltop center of Xunantunich, Belize focused on developing a chronology for the site's occupational sequence of architectural construction. During the 2018 field season, the Xunantunich Archaeology and Conservation Project, in collaboration with the Belize Valley Archaeological Reconnaissance Project, carried out stratigraphic excavations of Structure A7 in the Xunantunich site core to address these issues. Results from AMS 14C radiocarbon dating and analysis of architectural construction phases indicate impressive monumental construction at Xunantunich as early as the Late Preclassic period. This presentation reports on the results from the 2018 investigations and explores the possible socio-political roles of the hilltop center during the Preclassic.

Watkins, Tia [130] see Fitzmaurice, Rosamund

Watkins, Tia [178] see Saldaña, Gabriela

Watling, Jennifer (University of São Paulo) and Morgan Schmidt (Massachusetts Institute of Technology)

[161]

Identifying Past Vegetation Dynamics in Xingu Indigenous Territory Using Soil Phytolith Analysis

This paper presents the preliminary results of a soil sampling programme aimed at mapping precolumbian and historic vegetation dynamics in the Xingu Indigenous Territory, Brazil. Research carried out with the Kuikuro community during the last three decades has resulted in the archaeology of part of this area being one of the best-studied and best-mapped anywhere in Amazonia, but until now there have been no archaeobotanical or palaeoecological studies aimed at identifying plant management within these highly-complex cultural landscapes. By applying phytoliths, charcoal and geochemical analyses to strategically-placed soil transects that capture visible gradients of both modern (village > gardens > forest) and precolumbian (site > dark earths > unaltered soils) indigenous land-use, we aim to contribute new data on the history of forest composition and the distribution of resource management areas over the last 1,000 years of occupation.

Watling, Jennifer [161] see Schmidt, Morgan

Watson, Adam [98] see Fladd, Samantha

Watson, April (Lynn University) and Alanna Lecher (Lynn University)

[228]

Archaeology as the CURE (Course-based Undergraduate Research Experience)

Course-based undergraduate research experiences (CUREs) provide students the opportunity to explore research topics that are of interest to the broader scientific community, as well as community partners. CUREs also connect students in iterative work, by repeating and building on their own and others' work. This repetitive process aids in creating links between diverse subject areas, not limited to archaeology. Archaeology, with its wide ranging applicability in natural, applied, and social sciences, provides instructors an unique opportunity to take real world research and conceptualize scientific ideas by active engagement. At Lynn University, a small, private teaching-intensive university in south Florida, professors in archaeology, geology, and biology have begun collaborative efforts to instruct students in archaeological methods. These efforts include sediment analysis, geospatial modeling, marine biology, and taphonomy. By conducting research situated in a broad scientific curriculum, students build bridges from the classroom to the real world. These methods have shown success in students' persistence in STEM fields, as well as success in the university setting and beyond.

Watson, James [240] see Carpenter, Michelle
 Watson, James [180] see Chen, Jennifer

Watson, Jessica [12] see Holly, Donald

Watson, Valerie [56] see Mills, Rebekah

Watt, David [9] see Britt, Tad

Wattenmaker, Patricia (University of Virginia)

[205]

Urban Ideologies and Demographic Revolutions in Ancient Mesopotamia

Dramatic demographic growth is a hallmark of urbanism, yet reasons for population explosions in emerging urban systems are not well understood. This paper draws on archaeological and textual evidence of house practices and cultural values to explore why populations increased so dramatically in third millennium Mesopotamia. Additional consideration of some of the challenges to population growth serves to highlight the complex relationships among population growth, prestige building and inequalities in some early urban societies of Southwest Asia

Watts, Corinne

[34]

Monuments as Assemblages: Case Study at Falkner's Circle (Wiltshire, U.K.)

Archaeological study consistently relies on rigid classifications to explore and discuss the past. The study of monumentality within the discipline is no exception and has been built on a separation of nature and culture. The use of this dualism restricts the way that archaeologists can understand prehistoric structures and environments, as these frameworks effectively disarticulate these sites from their context. Using Falkner's Circle (Wiltshire, United Kingdom) as a case study I will re-examine how archaeologists have analyzed and categorized the site. Pulling on ideas of materiality and assemblage I will negotiate a new perspective on Falkner's Circle, as an individual site and as part of the larger landscape of Avebury, Wiltshire. This perspective makes it possible to see Falkner's Circle as an active assemblage. Each meaning and actor being articulated at different temporal and physical points—including the Mesolithic utilization of the site, the Neolithic formation of the larger structure, the Iron Age depositions, and the later destruction of the stones. While other theoretical frameworks have been applied, this perspective allows for Falkner's Circle to be understood as a reactive and engaged aspect to this larger region.

Watts Malouchos, Elizabeth (Indiana University)

[70]

Moderator

[70]

Discussant

Waweru, Veronica (National Museums of Kenya), Christine Ogola (National Museums of Kenya) and Job Kibii (National Museums of Kenya)

[232]

The Acheulean to Middle Stone Age Transition at the High-Elevation Yiapan Site in Mau Narok, Kenya: A Preliminary Report

The Acheulean/Early Middle Stone Age (MSA) transition period is important to understanding both the appearance of our own species and the attendant behavioral adaptations. In East Africa, few sites document this transition. Still, these sites are almost exclusively found within the rift basin at lower altitudes which favor preservation. At 2300m asl, Yiapan site is a high elevation stratified site that documents the terminal Acheulean and Early MSA at Mau Narok, Kenya. This paper presents temporal and technology aspects of this transition and contributes to a better understanding of behaviors that cover a wider range of habitats used by early members of our species. It is expected that the inclusion of data from non-basinal high elevation sites will result in a less-skewed archaeological record.

Way, Phylcia (SWCA), Abigail Key (UTA) and Jessica Smith (UTA)

[37]

Archaeology at Way Ranch: A Multicomponent Site in Central Texas

Way Ranch is a multicomponent site located on the Blanco River in Central Texas. The local and regional geographic and environmental settings are rich in resources, which reveals why specific areas were reused for millennia. Survey and excavation during the UTA field school from 2017–2019 identified cultural materials and features ranging from historic to middle archaic. The primary excavation areas are (1) Uptown—a palimpsest of historic and prehistoric materials, (2) Downtown—a major excavation block on an alluvial terrace with in situ deposits, and (3) the Rockshelter—a large burned feature with multiple ash lenses and artifacts. Overall, Way Ranch is an ideal laboratory for investigating changes in lithic technology through time.

Wayman, Joseph (Independent Researcher)**[162]***Further Experiments Exploring the Kinetics of Acheulean LCTs Interacting with Animal Footsteps*

Experiments using an animal footstep simulator and Acheulean LCTs at one sixth scale show more of the complex interaction between the forces of animal locomotion on the ground and LCTs as would have occurred if the devices were used as foot damaging devices placed in traps and animal trails.

Weakley, Jacob (University of Cincinnati)**[63]***Increasing Bone Volume and Body Size *Odocoileus virginianus* as Evidence of Intensification of Maize Agriculture in the Ohio Valley*

This paper examines chronocline variation in *Odocoileus virginianus* in the Ohio Valley during the Late Archaic, Middle Woodland, and Fort Ancient cultural periods to determine the relationship between body weight and intensification of maize agriculture over time. Astragali are examined from the Dupont (33Ha11), Twin Mounds (33Ha24), State Line (33Ha58), and Wynema (33Ha837) sites, respectively. Zoometric measurements including astragalus medial depth, medial length, and distal width are used to calculate bone volume and estimate the overall body weight of the deer. It is cogitated that the observed variation in body weight through time is attributed to the increase in availability and consumption of cultivated maize in the Ohio Valley.

Weaver, Brendan (Stanford University), Lizette Muñoz (University of Pittsburgh) and Karen Durand (Proyecto Arqueológico Haciendas de Nasca)**[143]***From Slavery to Servitude: Approaching Hacienda Worker Health through Transformations in Labor and Foodways in Nineteenth-Century South Coastal Peru*

The nineteenth century was a dynamic period for hacienda workers on the south coast of Peru. Once Jesuit vineyards with two of the largest enslaved afro-descended populations in rural coastal Peru, the haciendas of San José and San Javier and their annexes in Nasca's Ingenio Valley underwent dramatic changes with the replacement of their grapevines with cotton, and the introduction of new types of workers. Cantonese indentured workers were contracted beginning in the 1830s, and 1855 brought legal emancipation to the majority-enslaved workforce. Seasonally, highland Andean workers joined the demographically shifting permanent hacienda population. This paper uses evidence from excavated midden contexts at San Javier, San José, and San José's annex of Hacienda La Ventilla to explore these changing agroindustrial dynamics and worker health through the lenses of labor and foodways.

Webb, Dallin (Logan Simpson) and Michael Ligman (Logan Simpson)**[194]***A Diachronic Analysis of Land-Use and Subsistence Patterns in the Virginia Mountains, Nevada*

On a grand scale, we know that settlement and subsistence patterns have varied greatly across the Great Basin throughout prehistory. Using a theoretical framework based in human behavioral ecology, archaeologists have learned—among other things—that: (1) gathering and processing tools/features for “low-ranked” plants and seeds became more common; and (2) that large-scale communal hunting features saw more use later in time as human populations grew. We aim to investigate these trends on a relatively small scale within and around the Virginia Mountains in southern Washoe County, Nevada. In 2017 and 2018, Logan Simpson conducted five archaeological inventories here—totaling 17,985 acres—that resulted in the recordation of 199 prehistoric sites across a variety of landscapes, elevations, and habitats. Following the site typology for the “Sierra Front” region developed by Young (2014), these sites include everything from relatively straightforward Simple Flaked Stone Assemblages (SFSAs) and Quarries to Complex Habitation Assemblages (CHAs) and Stone Linears spanning multiple temporal periods. Using these high-quality, diachronic data, we hope to create a more fine-grained picture of how land-use and subsistence patterns changed across time in the Virginia Mountains.

Webb, Elizabeth [54] see Emery, Kitty

Weber, June (University of Nebraska, Lincoln), Effie Athanassopoulos (University of Nebraska Lincoln) and Amy Neuman (University of Nebraska, Lincoln)**[192]***Historic Archaeology of Lincoln, Nebraska: Defining Urban Trade and Industry at the Turn of the Twentieth Century*

An archaeological perspective on trade and industry in urban Nebraska has not yet been well defined. Comparative analyses of several collections excavated on the present-day University of Nebraska-Lincoln campus have begun to reveal the intricacies of local industry in conjunction with larger national trends. These collections provide a glimpse into daily life within the developing urban landscape of Lincoln, Nebraska, at the turn of the twentieth century. This research was developed from the student-led analysis of artifacts from three late nineteenth-early twentieth century archaeological sites. Diagnostic glass bottles and ceramics from a variety of features (e.g., cisterns, outhouses) were utilized for the bulk of this study. These materials lend themselves to sourcing their locations of manufacture and allow us to draw inferences on the probable lifestyles and economic stratification of the associated households. Furthermore, these collections provide the basis for local and regional comparisons and can reveal broader trends in the development of urban sites in the Plains region.

Weber, Marion (Universidad Nacional de Colombia), Natalia Acevedo (Universidad Nacional de Colombia, sede Medellín), Sebastián Betancur (Universidad Nacional de Colombia, sede Medellín), Joaquín Proenza (Departament de Mineralogia Petrologia i Geologia A) and Antonio García-Casco (Departamento de Mineralogia y Petrologia, Universi)

[246]

Provenance of Lithic Artifacts from the Nahuangue and Tairona Societies, Sierra Nevada de Santa Marta

Numerous lithic artifacts have been found in archeological sites in the Sierra Nevada de Santa Marta in northern South America that represent an important part of various museum collections in Colombia. This cultural heritage belongs to the Nahuangue (AD 100–1000) and Tairona (AD 1000–1600) societies. Many of these artifacts are prestige objects and include beads, winged plates (klangplatten), and anthropomorphic and zoomorphic figures made out of colored stones and rocks. Most materials are green (e.g., serpentinite, nephrite, basalt, and variscite), white or translucent (e.g., quartz), black (e.g., nelsonite), and red (e.g., cornelian). Initial provenance studies on these artifacts have shown that many of them were handcrafted from rocks and minerals that are found locally, within the Sierra Nevada. For instance, serpentinites and nephrites are often used for winged plates, and nelsonites for beads and cylinders. In contrast, other artifacts have been sourced from distant rock formations and mineral deposits, as is the case of variscite, the source of which lies to the east, in the Gran Roque Island in Venezuela. This suggests that complex interchange routes existed in prehispanic societies as well as a religious and hierarchical meaning given to specific colors and materials.

Weber, Sadie (Harvard University) and Michelle Young (Yale University)

[61]

Eating Local, Drinking Imported: Chicha Recipes and Identity Formation at Atalla, Huancavelica, Peru

This study combines microbotanical and stable isotope analyses to explore interregional interaction, cuisine, and identity formation during the late Initial Period and Early Horizon in the South-Central Andes, specifically at Atalla, a settlement and civic-ceremonial center in Huancavelica, Peru. Investigation of Atalla's ceremonial and domestic sectors, carried out from 2014 to 2017, has revealed much about the site's domestic economy, role in interregional exchange, and the foodways of its inhabitants. In order to obtain a more complete understanding of subsistence and interaction, residues extracted from ceramic sherds were analyzed for starch granules. We found that a wide variety of plants were used at Atalla, including cultigens that cannot grow within the site's immediate area, including manioc, chili pepper, yam, achira, algarrobo, and sweet potato). Evidence of ground, boiled, and possibly fermented starch granules points to the consumption of chicha whose ingredients included a combination of maize, manioc and algarrobo at Atalla. In this presentation, we explore the implications of such distinct chicha "recipes" with regard to identity formation during the Initial Period.

Weber, Steven [205] see James, Nathaniel

Webster, Chris (Wildnote)

[95]

Discussant

Webster, Chris (Wildnote)

[183]

Choosing the Right Hardware and Software for Challenging Fieldwork Conditions

From hardware to software to basic use and data entry, using something other than paper to record archaeological sites can be difficult and cumbersome. What tablet do you use? Do you even need a tablet? What about durability, weather, and battery life? When choosing software does it need to work offline? Is it easy to use? What about exports—how do I get my data out of the system? After 10 years of working with tablets in the field, I've come up with rock-solid methods and gear recommendations for digital archaeology. From the heat of the desert to the colds of the mountains there are solutions for everyone. Picking the right software, with the right company behind that software, is also very important. You need support and the confidence that it will work when you need it.

Webster, David (Penn State University)

[102]

Diachronic Puzzles in Lowland Maya Demography

Once a central topic of Maya scholarship, demographic modeling was heavily sidelined beginning in the 1990s. It is now experiencing a resurgence because of the application of lidar technology to much of the central and southern Lowlands. Once again the emphasis is reconstruction of Late Classic populations. Important as such reconstructions are for understanding Classic society and its "collapse," the *longue durée* of population change presents many puzzles.

Webster, David (Penn State University)

[152]

Discussant

Webster, David (Penn State University)

[181]

Discussant

Webster, Laurie (University of Arizona) and Kelley Hays-Gilpin**[2]***Snakeskin and Corn Markings: The Dotted-Diamond-Grid Pattern in the U.S. Southwest*

The dotted-diamond-grid pattern first appears on the textiles and pottery of the southwestern United States in the mid-AD 1000s or early AD 1100s. Fifteenth-century kiva murals from the northern Southwest confirm the importance of this design system for decorating ceremonial cloth prior to Spanish contact. In this paper we use evidence from textiles, ceramics, rock art, and other media to explore the spread of the dotted-diamond-grid pattern into the Southwest, from its ancient Middle American roots based on reptiles, water, maize agriculture, and fertility, to its incorporation into Southwestern ideologies and persistence in ritual practice.

Wedemeyer, Rachael (University of California, Riverside) and Kenichiro Tsukamoto (University of California, Riverside)**[197]***Investigating Bench Architecture and Iconography at El Palmar, Campeche, MX*

El Palmar is a major Maya polity located in southeastern Campeche, Mexico where recent excavations have been concentrated in the Guzmán Group. The following paper focuses on the central room of Structure GZ7, most likely a residence of non-royal elite's leaders, known as lakamob (banner-bearers). Structure GZ7 is comprised of three rooms, each accompanied by an eastern and western gallery, and was occupied during the Late-Terminal Classic periods (AD 600–850). The western gallery of the central room holds a distinctive bench with a reclining backrest. Such benches are often depicted in courtly scenes of polychrome vessels but are rarely seen in physical architecture. Examinations of the masonry bench at Structure GZ7 provide deeper insights into the internal political organization of the El Palmar dynasty. A comparative study of this feature within the Petén and Rio Bec regions further refines our understanding of non-royal elites in Classic Maya society.

Weeks, Lloyd [59] see Cable, Charlotte

Weeks, William (Chattanooga State Community College)**[99]***Come as Strangers, Leave as Friends: An Invitation to A. Irving Hallowell's Essay on "Ojibwa Ontology, Behavior, and Worldview" for Soul-Searching Archaeologists*

Who do archaeologists mean by souls? If their terminology closely aligns with the notion of persons, then A. Irving Hallowell offers some enduring insights in his often cited but seldom digested essay, "Ojibwa Ontology, Behavior, and Worldview." Through ethnographic examples drawn from the everyday life of the Berens River Ojibwa (eastern Manitoba, early twentieth century), he showed how a small indigenous community seemed to extend the potential for personhood far beyond the limits of many western conceptions and in ways that appeared to defy any presumption of a natural-supernatural dichotomy. According to Hallowell, personhood among the Ojibwa was attributed circumstantially and individually rather than absolutely and categorically. A person was understood to have a stable inner vital essence and an outer appearance that could metamorphose and was ambiguous. Hence, strangers—human or otherwise—may be greeted with as much kindness and as caution. Solidarity was hard won through experience and personal testimony. Foremost, someone—not something—was responsible for all that happens, especially the death of kin. As archaeologists become aware of their naïve realism and avail themselves to native relational possibilities with Hallowell's attitude, they will find tremendous potential for learning from those who came before and their respective descendant communities.

Weetaluktuk, Tommy [50] see Ryan, Karen

Wegmann, Karl [195] see Holcomb, Justin

Wehner, Ivan [252] see Berman, Mary Jane

Wei, Dong [212] see Wang, Chunxue

Wei, Tianxu, Chunxue Wang, Jixiang Song, Jiaxin Dou and Jiaqi Wang**[36]***Many Late Paleolithic Sites Have Been Found in Suifen River Basin*

The Suifen River Basin is located in the northeastern part of the Old World. It is an important transportation hub for the migration and exchange of people in the Pleistocene, between the New World and the Old World, and has important Paleolithic archaeological significance. In 2017 and 2018, we conducted archaeological investigations along the Suifen River and found 22 sites. Most of these sites date to the late Paleolithic, and some may be of Neolithic Age. In these sites, we found a variety of stone cores, a large number of flakes and abundant blade tool assemblage, indicating that there was modern people once camped, multiplied and thrived here in the upper Paleolithic.

Weik, Terrance**[259]***Cattle Colonialism in Chickasaw Mississippi*

Indigenous and enslaved people's increasing global encounters with cattle in the nineteenth century present unique vantage points

from which to understand the diversity of engagements with capitalism, colonialism, and settler imperialism. The archaeology of Levi Colbert's Prairie (LCP) and landscapes of Chickasaw territories in what became the U.S. Southeast demonstrate the culturally specific and entangled practices and experiences of Africans, Native Americans, and Europeans who facilitated ranching, exchange, conflicts, and cooperation. An exploration of logistical models of pastoral capitalism at LCP contributes to a broader understanding of emergent cattle colonialism, which extended as far as the Pacific Ocean. Archival sources such as maps and head counts (human or bovine) are fruitful forms of evidence that, along with artifacts, animal bones and other forms of data, lend themselves to complementary and unique lines of inquiry. The resulting research can make valuable contributions to our understanding of economic processes, material and cultural flows, and social and experiential aspects of labor.

Weinberg, Camille (University of Texas, Austin), Jo Osborn (University of Michigan), Kelita Pérez Cubas (Pontificia Universidad Católica del Perú) and Richard Espino Huaman (Universidad Nacional San Luis Gonzaga de Ica)

[125]

Where the Wild Things Grow: Desert Resources and Risk Management on the Peruvian Coast

Desert landscapes are often characterized as barren due to their minimal vegetation. On the Peruvian coast, the aridity is accompanied by El Niño climate fluctuations that can pose destructive hazards for coastal populations. Yet humans have continuously occupied this desert for millennia, and there are highly productive ecosystems that create ecological variation within a seemingly static and inimical environment. There is also growing evidence that this landscape, and the availability of these resources, has changed dramatically over time. This paper considers the role of wild resources for Prehispanic coastal inhabitants of Peru's South Coast and how mosaic subsistence strategies may have been a strategy to mitigate risks associated with El Niño perturbations. I discuss botanical data from the Topará Valley to examine how littoral populations relied on wild plant resources and marine species in this arid environment during the Late Paracas Period in the final centuries BCE, despite the availability of agricultural cultigens.

[125]

Chair

Weinberg, Camille [21] see Osborn, Jo

Weintraub, Neil [255] see McNamee, Calla

Weir, Donald (Commonwealth Heritage Group)

[58]

Forty-Four Years of Doing Cultural Resources Management

Commonwealth Associates, Gilbert/Commonwealth, Commonwealth Cultural Resources Group, and Commonwealth Heritage Group. Forty-four years of doing cultural resources management (CRM) work. Fourteen years working for a large private corporation and 30 years as the owner of my own firm with 10 offices in eight states. This paper will discuss the early years (1974–1988) when my work consisted of providing CRM support for large projects being developed through the NEPA process and later years (1988–2018) working primary with the Section 106/110 process. The profession of CRM has come a full circle in those years. The early work was done as part of a large teams represented by many disciplines, the middle years were mostly working on archaeology with little impute from other professionals, in the later years we realized that archaeology worked best by including a wide range of other professionals. It is important to understand that archaeology is one of many resources to be considered in project development. In addition, I will discuss my experience with expansion through acquisitions, and my experience with ownership transition to my son Andrew J. Weir, RPA.

Weisler, Marshall (University of Queensland), Quan Hua (Australian Nuclear Science and Technology Org.), Jian-xin Zhao (University of Queensland), Hiroya Yamano (National Institute for Environmental Studies) and Ai Du Nguyen (University of Queensland)

[100]

Determining the Chronology of Reef Island Development for Constraining Initial Human Colonization of Pacific Atolls

As recent worldwide news coverage has aptly reported, Pacific coral atolls are the most precarious landscapes for human settlement, yet many of them evidence continuous occupation for 2,000 years. Coral atolls are unique in their small size, low elevation, limited diversity of terrestrial flora and fauna, poorly developed and unconsolidated soils, and absence of surface potable water—all characteristics that constrain human settlement. Indeed, global warming has accelerated sea level rise that is altering shorelines, eroding archaeological sites, and inundating modern villages and gardening zones. Consequently, how did small human founding groups survive over the millennia and, in a sense, flourish on these most challenging of Pacific landscapes? Our multi-disciplinary research utilizes information from archaeology, island emergence and development, and sea level rise to understand human colonization and adaptation to Pacific low-lying coral atolls. Atoll emergence constrains the earliest time possible for human colonization—the dating of which is fundamental for addressing the tempo of economic and social change and for charting population growth. Using dated samples from habitation layers and paleo-sea-level indicators, we reconstructed sea-level history, island emergence, and facies development for constraining the period of initial human colonization at Ebon Atoll, southern Marshall Islands, eastern Micronesia.

Weisler, Marshall [27] see Rogers, Ashleigh

Weiss, Jeremy [186] see van Leeuwen, Willem

Welch, John (Simon Fraser University)**[116]***Moderator*

Welch, John [1] see Hodgetts, Lisa

Welch, John [122] see Loughran, Kailey

Welker, Martin (Arizona State Museum) and Eréndira Quintana Moranes (Northern Illinois University)**[22]***Meta-analysis of the North Atlantic Cod Fisheries: The Zooarchaeology of the Sixteenth to Nineteenth-Century Trans-Atlantic Cod Trade*

The distribution and abundance of animal populations have significantly impacted human settlement decisions, mobility, economics, and conflict throughout history. The abundance of cod (*Gadus morhua*) in North Atlantic fisheries enticed English, French, and Basque fishermen to the region to catch, salt, and export cod to Europe. Efforts to monopolize economically important cod fisheries in the region led to repeated military conflicts between major European powers. Despite this, the archaeological record of the cod trade in North America, and archaeological evidence for the trade of cod from the North Atlantic to other North American and European ports have not been widely studied. Our study focuses on zooarchaeological evidence from the sixteenth to nineteenth centuries. We show that though cod remains are abundant in the regions where they were caught and processed, they show up only infrequently in other North American assemblages. Furthermore, though North Atlantic cod have been previously identified in European assemblages, they are found primarily in regions where cod had been, or were still available. These results contribute to our understanding of cod's important economic role in the development of North American trading ports and reveal trans-Atlantic connections in post-medieval Europe.

Wellman, Hannah (University of Oregon), Megan Spitzer (Smithsonian National Museum of Natural History) and Torben Rick (Smithsonian National Museum of Natural History)**[129]***Archaeology and Ethnobiology of Late Holocene Bird Remains from the Northern Oregon Coast*

Archaeological bird remains from the Oregon coast have recently received renewed attention. We contribute to this discussion with an analysis of bird remains from the Late Holocene Par-Tee site (35CLT20) in Seaside, Oregon. We sampled the Par-Tee avifaunal assemblage to near-redundancy and generated the largest sample from a single site on the Oregon Coast to date (N=7204). Our results support previous Oregon coast avifaunal assemblage analyses. The Par-Tee assemblage is dominated by near shore or estuarine birds including scoters, alcids, and shearwaters. There are also small amounts of unique species such as the California condor (*Gymnogypus californianus*) and the short-tailed albatross (*Phoebastria albatrus*), both of which are currently endangered and face conservation challenges. The Par-Tee avifaunal assemblage is diverse, but people at the site focused on acquiring the most accessible species in the near shore habitat. Our study of the Par-Tee bird remains helps clarify the nature of past human-bird interactions in coastal Oregon, emphasizes the importance of sample size in documenting species of conservation concern that may be rare in the archaeological record, and illustrates the value of zooarchaeological studies of archaeological legacy collections.

Wells, Joshua (Indiana University, South Bend)**[95]***Discussant***Wells, Joshua (Indiana University, South Bend), Eric Kansa (Open Context), David Anderson (University of Tennessee), Erick Robinson (Utah State University) and Sarah Whitcher Kansa (Alexandria Archive Institute)****[183]***Growing Convergence between Compliance and Research Archaeology through Linked Open Data Strategies in the Digital Index of North American Archaeology*

The Digital Index of North American Archaeology (DINAA) is a linked open data hub situated to help illuminate theoretical and practical connections between compliance archaeology and broader realms of archaeological science and public knowledge. This paper provides an assessment of prevalence of compliance activity represented in the approximately one million archaeological sites registered with DINAA. Areas of dense compliance activity are then compared against topic models for those areas built from the DINAA Linking Sites and Literature module, which contains citation information for journal articles, grey literature reports, and Federal Register communications. Using these two vectors of information focused on geographical areas of interest (density of compliance activity and topical foci in heritage research and preservation) we suggest compelling issues on which compliance firms and practitioners may converge with one another and with colleagues in other sectors to create data interoperability based upon integration of shared goals as reflected in intermingled concepts. Because DINAA is a completely free and open-source (CC BY and CC 0) information project, we further define practical ways that DINAA resources and other free and open-source tool kits may be leveraged by professional communities seeking to create ethically, financially, and reproducibly sustainable processes of convergence.

Wells, Joshua (Indiana University, South Bend)**[217]***Moderator*

Wendel, Martha [255] see Forste, Kathleen

Wernecke, D. Clark (Gault School of Archaeological Research) and Ashley Lemke (University of Texas, Arlington)

[170]

Keep Calm and Doodle On

Art work, defined very broadly, is found on every continent apart from Antarctica, and is shared trait across humanity. Art work in the form of incised or engraved stones, shell, and bone is among some of the earliest found by archaeologists. The time depth of these objects continues to increase, demonstrating a long tradition to this universal human trait. Incised and engraved objects are becoming increasingly common in the archaeological record and most represent abstract patterns of zigzags, crosshatches, and simple lines. Drawing or "doodling" can have profound effect on the processing of information and communication, and problem-solving. Cross-cultural studies demonstrate that children have the same evolution in visual logic as they grow. Both the archaeological record and contemporary studies demonstrate that doodling, perhaps taking the form of incised objects found in the archaeological record, has powerful evolutionary implications.

Werness-Rude, Maline (Ventura College) and Kaylee Spencer (University of Wisconsin-River Falls)

[164]

Furnishing the Plaza: Classifying and Examining Northern Plaza Features

As major components of the built environment and features that helped define the center of any given site or neighborhood, both literally and ideologically, Maya plazas have received considerable scholarly attention. So too have their various features, like the palaces, sacred spaces, and/or administrative structures that bound them, or their internal furnishings, such as stelae, caches, altars, and/or small platforms. Many questions remain regarding such features, however: How were altars incorporated into plaza use patterns? How strongly and widely held was the significance of central placement, or the connection with site foundation and dynastic succession, and/or associations with burials/caches? Did examples without iconography carry the same associations as those with imagery and text? When we turn to the Northern Maya area more specifically, the questions proliferate: What is the distinction between the altar and some small platforms, as types? How do these elements relate to entrances or to the iconographic feet of balustrades found in the plaza's architectonic frame?, for example. In this paper, we explore the classification of such plaza features. We also work to understand the ways in which they would have impacted and facilitated behavior in Northern site centers.

Wernke, Steven (Vanderbilt University)

[32]

Moderator

Wernke, Steven (Vanderbilt University)

[200]

Discussant

Wernke, Steven [175] see Zimmer-Dauphinee, James

Wescott, Konnie (Argonne National Laboratory), Thomas Chiodini (Argonne National Laboratory), Alison Rubio (AFCEC), Perri Gerard-Little (Argonne) and Kendra Kennedy (Argonne)

[184]

Community Outreach Efforts for Cultural Resources on Air Force Installations

What else lies inside the fence? Alongside military operations and infrastructure, many installations hold important natural and cultural resources. The Air Force Civil Engineer Center funds community outreach projects to enhance military and civilian awareness of these resources. Argonne National Laboratory is assisting with several projects, from developing interpretive signs battered by intense sun, volcanic ash, and corrosive salts, to smartphone applications that offer self-guided historical tours. These projects raise awareness of resources within the fences, decreasing the risk of unintentional damage, increasing public appreciation, and suggesting opportunities for further research. Argonne has assessed material solutions and techniques for increasing sign longevity in harsh climates on Ascension Island; developed a smartphone application that provides audio tours and Quick Response (QR) code scanning based on geographic location at Joint Base San Antonio; and designed interpretive signs and brochures for important resources, including Hustler Hut at Little Rock Air Force Base (AFB), Hanover Furnace at Joint Base McGuire-Dix-Lakehurst, a nature trail with archaeological and natural resources at Laughlin AFB, and historic structures at Tinker AFB. These projects resulted in durable, easily maintained, and accessible information, allowing the public and military personnel to learn about history inside the fence.

Wesolowski, Veronica [240] see Di Giusto, Marina

West, Catherine (Boston University), Michael Etnier (Western Washington University), C. Fred Andrus (University of Alabama), Caroline Funk (University of Buffalo) and Megan Partlow (Central Washington University)

[59]

On the Ice Edge: Abrupt Climate Change in the Aleutian Islands

The interdisciplinary Unalaska Sea Ice Project (USIP) tests the hypothesis that sea ice was present in Alaska's Aleutian Islands during the Middle Holocene. Global evidence suggests that there was sea ice expansion during this period across the northern hemisphere, which would have had significant effects on human and animal activity in temperate regions. The Eastern Aleutian Islands provide a case study to test the local effects of this change: previous studies have suggested that sea ice expanded into the Aleutian Islands, citing evidence of ice-loving animals in the zooarchaeological record. However, the co-occurrence of temperate species in this record challenges this conclusion and complicates our understanding of sea ice, human adaptation, and animal

behavior through time. This interdisciplinary project integrates multiple lines of archaeological and paleoenvironmental evidence—sclerochronology and oxygen isotopes, faunal analysis, stable isotope analysis, and artifact analysis—from Unangan ancestral sites on Unalaska Island. Here we present the preliminary results of this project in the context of contemporary climate change.

Westbury, Michael [64] see Szpak, Paul

Weyrich, Laura (University of Adelaide), Raphael Eisenhofer (University of Adelaide), Atholl Anderson (Australian National University), Keith Dobney (University of Liverpool) and Scott Fitzpatrick (University of Oregon)
[100]

Utilizing Ancient Oral Microbes to Track Human Migrations across the Pacific Islands: Insights from Palau and Beyond

Ancient human migrations underpin the origin of past cultures, health, ecological interactions, and identity. However, recent or rapid migrations are difficult to track using classical demographic tools that monitor human genetic mutations over time. A new method—tracking human migrations by assessing microbial genome evolution over time within calcified dental plaque—provides a unique solution to this problem. Here, we sequenced ancient DNA preserved within calcified dental plaque from more than 150 ancient individuals spread throughout the Pacific Islands from Micronesia to Polynesia. We explore the oral microbial communities in 16 different Pacific Island Nations, revealing unique insights into oral health and diet. We also use a phylogenomic approach to reconstruct the evolutionary history of 10 different vertically-inherited oral microbes preserved across all individuals to investigate past movements throughout the Pacific. In specific, a key oral species within the Anaerolineaceae family improves resolution provided by past human ancient DNA studies and provides exciting new insights into the settlement of the Pacific Islands, especially Palau. Overall, this study highlights how ancient human-associated microbes can offer key demographic and cultural insights, revealing this method as a minimally invasive method to identify past cultures and potentially repatriate human remains.

Wharton, Jeffery [229] see Stephens Reed, Lori

Wheaton, Gene [231] see Gillaspie, Amy

Wheelbarger, Linda (San Juan College)
[267]

Analysis of Ceramics from the Point Pueblo D-Shaped Chacoan Great House, Northwestern New Mexico

The past two years of excavation at Point Pueblo, derived from San Juan College field school sessions and volunteer work, revealed a D-shaped Chacoan great house associated with the known Chacoan great kiva. The 2018 excavations concentrated on rooms within the arc and yielded information that they had been used for domestic activities during the Pueblo III time period. The 2019 excavations concentrated on four of the large multistory rooms attached to the north side of the arc of rooms. Rooms 30 and 31 each provided evidence of a burned roof/ceiling/floor situated between their upper and lower story rooms. Pueblo III ceramics were present in the upper story rooms. Abundant Pueblo II ceramics including a number of partial vessels were recovered from the floor exposed within Room 34 as well as from room fill. Less work was completed on Room 33, although those artifacts are included in this ceramic analysis also. Previous ceramic analyses have provided information that Point Pueblo ceramics are predominantly local in origin but also include large quantities of tradewares from the south and west. The goal of this analysis is to assess the extent of Chacoan influence and interaction at Point Pueblo.

Wheelbarger, Linda [236] see Rospopo, Steven

Wheeler, Ryan (Robert S. Peabody Institute of Archaeology)
[254]

The Journal of Archaeology and Education

Archaeologists Meg Conkey, Dan Sandweiss, Ryan Wheeler, and Nancy Gonlin founded the Journal of Archaeology and Education in 2017 at the Robert S. Peabody Institute of Archaeology. The JAE reflects the institute's long-standing interest in using archaeology in the classroom and is hosted at the University of Maine's Digital Commons website (<https://digitalcommons.library.umaine.edu/jae/>). A peer-reviewed, open-access, online journal is a major step in fostering a sense of community among the diverse individuals engaged in archaeology and education. The format ensures equal access to interested parties; it also is a platform dedicated to disseminating research and sharing practices in archaeological education at all levels. The JAE's mission statement is broad, and publishes articles dealing with education in its widest sense, both in and out of the classroom—from early childhood through the graduate level—including public outreach from museums and other institutions, as well as professional development for the anthropologist and archaeologist. Archaeology can play a significant part in education at all levels and the Journal of Archaeology and Education is intended to provide a home for the growing community of practitioners and scholars interested in sharing their first-hand experiences and research.

Whelan, Carly (California State University, Chico)
[15]

Why Delay Dinner? A Future-Discounting Approach to Examining the Origin and Evolution of Food Storage

Food storage is a critical adaption in environments with seasonal resource disparities, but it also serves a key social function by permitting the accumulation of capital and making redistributive economies possible. Yet, storing food is costly relative to consuming it immediately, as storage leaves food vulnerable to decay and theft. This raises the question of how this practice could have

evolved. I present a model that incorporates the concept of future-discounting to examine the adoption of storage, as well as the choice of which foods to store. Storage is expected to evolve when the value of stored food exceeds the value of food that could be acquired and consumed immediately, taking into account the time needed to collect and process it. This could occur in seasonal environments, or in situations in which the caching of surplus food entails little cost. In some regions, experimentation with dispersed caching likely gave way to formal central place storage, which reduces the risk of loss of a cache through regular monitoring throughout the storage period. Because of this, central place storage produces a higher return rate than dispersed caching, which may have caused incipient delayed return economies to become more firmly entrenched.

[15]

Chair

Whelan, Carly [188] see DeGeorgey, Alex

Whisenhunt, Mary (University of Texas, San Antonio), John Roney (Colinas Cultural Resource Consulting), Robert Hard (University of Texas, San Antonio), Lori Barkwill Love (University of Texas, San Antonio) and Toni Lambach
[122]

Living on the Mimbres Western Edge: Regional Affiliation in Arizona's Upper Gila River Valley, AD 750–1300

Data derived from archaeological survey and local informant knowledge in southeastern Arizona's York-Duncan Valley provides new insights into regional affiliations and potentially the identity of those living on the far western edge of the Mimbres region. From 2014 to 2019, University of Texas at San Antonio field school participants and Colinas Cultural Resource Consulting partnered to survey and work with the local community to record nearly 80 prehistoric and historic sites. Site surface assemblages in the research area represent the entire sequence of Mimbres-Mogollon ceramic types, suggesting valley communities established enduring internal social relationships and long-term continuity of occupation. Decorated pottery designs and types, and the presence of non-local ceramics and exotic trade materials, reveal distinct relationships with external groups and suggest an identity both similar to and different from those living in the Mimbres Valley. Analysis of a recently acquired collection of whole pot photos acquired from a local informant offers additional insights into the York-Duncan Valley's cultural diversity and interregional relationships.

Whisenhunt, Mary [156] see Zaragosa, Gabriella

Whitcher Kansa, Sarah [183] see Wells, Joshua

Whitcomb, Donald (University of Chicago)
[261]

Archaeological Investigation of the Islamic City

The Islamic city has been the focus of many general studies in Islamic Archaeology and interest has only increased with time. As fieldwork is increasingly difficult, this is perhaps the time for generalizing examination of the field. Specialized field are still often possible and need to be encouraged, especially for young archaeologists. Likewise, examination of older excavations from fresh urban perspectives may well be encouraged. This paper will suggest or rather hope to encourage new research in this field.

White, AJ [140] see Maher, Lisa

White, Loren (Oregon State University)
[195]

Geoarchaeological Insights from a Late Pleistocene–Terminal Holocene Site on Isla Cedros, Baja California

Current geoarchaeological investigations of the Cerro Pedrogoso (Rocky Hill) site on Isla Cedros, Baja California seek to provide a context for a Late Pleistocene and Early Holocene human occupation along the Pacific Coast. Here, a rich assemblage of artifacts signals the presence of maritime coastal adaptations from at least 12.6 cal ka. A series of stratigraphic exposures and seven archaeological excavation units reveal the local geomorphic history and repeated cultural occupations. Intact deposits were characterized, dated, and correlated for lithostratigraphic and pedologic continuities. Topography and lithofacies were mapped with a laser transit to display excavation units and stratigraphy in three dimensions. A regional interplay of tectonic and hydrologic factors controls the discharge of nearby freshwater springs that likely had a singular influence on the locus of cultural activities here. I hypothesize a model of combined aeolian and alluvial fan deposition during the Late Pleistocene and Early Holocene epochs with subsequent landform incision and stability. Soil and climate geomorphic factors were also considered to further assess this site's formation and taphonomy. Identifying paleoclimatic influences on Cerro Pedrogoso's situation in the larger landscape may be generally instructive to understanding cyclical landform evolution on the Baja peninsula at the Pleistocene-Holocene transition.

White, Nancy (University of South Florida)
[222]

Middle Woodland and Mississippian People and Practices at Richardson's Hammock Burial Mound (8Gu10), Northwest Florida

Richardson's Hammock is a large-gastropod shell midden and burial mound site on the shore of salty St. Joseph Bay. Test excavation in the habitation area has documented coastal subsistence continuity over a millennium. Now a collector has requested study of materials looted from the mound 40 years ago. The mound, one that C. B. Moore missed, had both Swift Creek and early Weeden Island ceramics, typical elaborate pottery for the Middle Woodland (ca. AD 350–700) in the Apalachicola-lower Chattahoochee valley region. It also had intrusive later burials from Fort Walton times (the local variant of Mississippian; ca. AD 1000–1500), with ceramics and two artifacts representative of the Southeastern Ceremonial Complex: a copper (plate?) fragment,

and a carved-shell "spaghetti-style" gorget. Other grave goods could be from either component. Human bone represents at least 10 individuals. Most have cranial modification and expectable minor pathologies. Radiocarbon dating and analyses of stable-isotope and ancient DNA samples are underway, supported by a National Geographic Society grant, and in collaboration with a local Native American representative. Preliminary data from these studies and how they augment the archaeological record will be discussed. After the research, we hope for respectful reburial of the remains.

[222]

Chair

White, Sean (University of Colorado, Boulder) and Karen Schollmeyer (Archaeology Southwest)

[122]

Mealing Bins: An Analysis of Cultural Connections

Mealing bins are an important architectural feature in the U.S. Southwest with potential for helping us understand cultural connections between places and populations. Mealing bins are food processing features usually found with two major components: grinding stones to grind corn kernels or similar foods and a receptacle to catch the processed flour, both of which are built into room floors. These features have been used in the southwest as diagnostic evidence to associate archaeological sites with specific archaeological material culture traditions, including Mogollon. This poster examines the geographic and temporal distribution of mealing bins. It also examines the usefulness and reliability of these features as indicators of links to specific archaeological culture areas.

Whitehead, Hunter [18] see Van Slyke, Andrew

Whitehead, William (SWCA Environmental Consultants)

[183]

Recent UAV Data Collection and Integration with Traditional Archaeological Methodologies

UAV data collection has become increasingly common in North American archaeology. This presentation will give an overview of the state of the art in UAV data collection, technologies, and processing methodologies. All fronts in UAV data collection are progressing at an ever increasing pace, making staying up to date almost impossible for most archaeologists. Aircraft, payloads, software, and mapping techniques have made it even easier for UAV technology to be integrated into all aspects of fieldwork. Examples of landscape mapping, intensive site mapping, and terrain analysis will be given, with the methodologies recommended to repeat the results.

Whitley, David (ASM Affiliates Inc.)

[60]

Terminal Pleistocene Petroglyph Traditions in North America

At least four Terminal Pleistocene/Paleoindian petroglyph traditions have been identified in western North America. The Great Basin Carved Abstract Tradition was short-lived and relatively localized in the northwestern Great Basin. The Great Basin Tradition persisted for millennia but its range contracted and expanded during that period. Eastern and Western Northern Plains traditions were restricted to the Terminal Pleistocene/early Archaic but later rock art traditions in these regions have similar geographical distributions, suggesting some form of long-term cultural continuity. Correlates of the different traditions in the larger archaeological record provide insight into the regional social dynamics of this early period.

Whitley, David [8] see Whitley, Tamara

Whitley, Tamara (Bureau of Land Management), David Whitley (ASM Affiliates) and Johannes Loubser (Stratum Unlimited)

[8]

Climate Change and Occupation on the Carrizo Plain National Monument

The Carrizo Plain National Monument (CPNM) contains some of the most significant Native American heritage sites in the United States. A cultural landscape, including habitations, camps, quarries, and pictograph sites, has been designated as the Carrizo Plain Archaeological District National Historic Landmark (NHL). An important thematic element for the NHL involves the research values specifically related to landscape-level studies of long-term human occupation. Of particular interest has been evidence for climate change as a driver for settlement within this region. This has been described by Whitley, Loubser, and Simon (2007), who have developed a model for climate-related settlement pattern changes on the CPNM. Parameters for testing this model include temporal changes in the nature, location, and dispersal of pre-contact sites, as these changes may relate to the regional climatic record. Assessments based on broadly defined climate regimes provide positive correlations, but it may be possible to further refine this modeling through CPNM climate-focused lakebed core sampling studies, which are ongoing. This poster will provide information on current modeling and site data, and discussion of current studies.

Whitlock, Bethany (Brown University)

[200]

Emplacing Empire: Inka Presence and Power in the Central Utcubamba Valley, Chachapoyas, Peru

In recent years, archaeological research on empires has shifted away from top-down approaches toward a focus on the affective, institutional, and material correlates of imperial processes. Approaches to Inka imperialism have embraced this trend: in contrast to earlier research, which focused on the typological classification of Inka "conquest", recent analyses have foregrounded the ways in which empires are emplaced through diverse assemblages of affective practices. Here, I follow this shift, specifically focusing on

how the emplacement of Inka architecture in pre-existing settlements can inform our understanding of local experiences of Inka imperialism. Taking the sites of La Fila and Llaucán as a case study, I combine architectural, excavation, and ceramic analysis to consider how Inka rule was enacted, emplaced, and experienced in one rural community in the Central Utcubamba Valley, Chachapoyas. While previous research on the Inka conquest of Chachapoyas has focused principally on the idea of an epic conflict between the invading Inka and Chachapoyas residents, I instead focus on the local-scale ways in which the Inka engaged with Chachapoyas' landscapes and peoples.

Whitney, Kristina (U.S. Army Corps of Engineers), William Hooker III (National Cemetery Association Department of Veterans Affairs) and Andrea Gregory (U.S. Army Corps of Engineers)

[132]

A New Push for the MCX: Historic Preservation with the National Cemetery Administration

Following in the spirit of Dr. Trimble's push for new ideas and management of cultural resources, USACE is working with the Department of Veterans Affairs National Cemetery Administration on a long-term historic preservation project focusing on superintendent's lodges listed on the National Register of Historic Places located in national cemeteries. As is typical of federal infrastructure, these 57 lodges were all erected prior to 1950 and are in need of repair and rehabilitation meeting Secretary of Interior's Standards. The project is complex for a variety of reasons: the lodges are located across the country, are different architectural styles, have different periods and themes of significance, and have distinct needs for treatment. These are a unique and particular resource for our national cemeteries; each building is a record of changes in cemetery administration and planning since the Civil War. The Mandatory Center of Expertise for the Curation and Management of Archaeological Collections is excited to take on this logistically complex project due to its unique nature and the ongoing need and concern for managing federally owned historic properties. This paper will examine the Center's first steps into historic preservation management and review several examples of the lodges managed by the NCA.

Whittaker, John (Grinnell College), Chuck LaRue (Independent Researcher) and William Bryce (Southwest Archaeology Research Alliance)

[69]

The Atlatl in Basketmaker Rock Art

While atlatls (spearthrowers) were used before the advent of bow-and-arrow technologies all over the Southwest, and indeed the North American continent, in only a few places did they loom large enough in the imaginations of their users to become major components of symbolic expression. In the SW corner of Utah and adjoining canyon lands, the Basketmaker "culture" produced an unusual clustering of atlatl and dart images. There are not only animals with projectiles in them, common in many areas but also depictions of conflict, and detailed depictions of atlatls and darts. The associations and images reflect concerns with hunting, fertility, conflict, dualism, and other issues to which atlatls are functionally or symbolically attached.

[69]

Chair

Whittaker, William [8] see Kendall, Bryan

Whittington, Jennifer [170] see Horn, Marty

Whittlesey, Stephanie (Standing Reed Books) and James Reid (Professor Emeritus, University of Arizona)

[156]

Episodic Change among Ritual Structures in the Mogollon Highlands

A well-dated sequence of ritual structures is recorded in the Mogollon Highlands. Beginning with what Reid and Montgomery (1999) have called low-walled, masonry-and-jacal protokivas, the next architectural features are small, rectangular, masonry kivas and plazas. Last, some plazas were converted to great kivas. Different symbolologies and social groups were associated with each type of structure, although similarities run through the sequence. This ritual and architectural sequence has implications for the traditional phase system and the influence of ethnicity on ritual organization. When chronology is robust and supported by tree-ring dates, we see that the change from protokivas to traditional kivas to great kivas took place within a span of 50 years and within a circumscribed area, at sites only about a mile apart—far less than the times and space defined for most Mogollon Pueblo phases. In addition, we believe that ethnicity—specifically, Mogollon Pueblo versus Ancestral Pueblo—influenced the form and function of ritual structures.

Wholey, Heather (West Chester University), Daria Nikitina (West Chester University), Katherin Dowling (West Chester University) and Michael Powers (West Chester University)

[9]

Prioritizing Site Loss in the Delaware Bay, USA, Using Probabilistic Modeling

The Delaware Bay is the second-largest estuary along the U.S. Atlantic coast and is experiencing some of the gravest effects from climate-driven sea-level rise along the east coast. Certain areas along the bay have the lowest mean elevation in the U.S. and are experiencing both accelerated sea-level rise and coastal subsidence. Coastal sites are often at an elevation of one meter or less and subject to daily tidal action, storm surge, and long-term inundation. The archaeological heritage of the region encompasses diverse occupations by Dutch, Finns, American Indians, and Africans, and is represented by iconic cultural landmarks such as Native American villages; seventeenth-century Dutch settlements; nineteenth-century resort towns; and, WWII defensive installations. We propose that the projected impacts to known and potential archaeological resources and should be modeled using

Probabilistic sea-level projections (Kopp et. al, 2016) based on the Representative Concentration Pathway 8.5 gas emission scenario (IPCC A5) which accounts for atmospheric carbon concentration and incorporates regional processes influencing relative sea-level rise. Results can yield localized and even site-specific decadal inundation projections up to 2100 that we demonstrate provide a useful prioritization and planning tool for known and potential archaeological resources.

[9]

Chair

Wholey, Heather (West Chester University)

[220]

Discussant

Whyte, Rachel (University of Central Florida), Michael Callaghan (University of Central Florida) and Brigitte Kovacevich (University of Central Florida)

[5]

Working toward a Lost Cause? Comparing pXRF Analysis to Neutron Activation Analysis and Petrography using Maya Ceramics from Holtun, Guatemala

Recent research has demonstrated that Handheld (portable) X-ray fluorescence spectrometers (pXRF) have difficulty in consistently and accurately determining chemical composition of non-homogenous cultural materials such as ceramics. This is unfortunate as pXRF instruments have proven to produce accurate and consistent compositional data for other archaeological materials like obsidian and metal. They are also known for being a non-destructive way to test chemical composition, maintaining the artifacts integrity; saving time, money and solving issues related to the transportation of artifacts. While pXRF instruments do not always perform as well as conventional methods, such as Neutron Activation Analysis (NAA), bench-top XRF, and Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS), they still allow archaeologists to identify other patterns related to composition. In this paper I report on the chemical compositional patterns generated through handheld XRF study of ceramic sherds from the Maya site of Holtun, Guatemala. These sherds have been previously run with NAA and subject to petrographic analysis. I compare the pXRF data for ceramic pastes with the NAA and petrographic data to further test limitations of pXRF on archaeological ceramic pastes, and to identify any patterns unique to pXRF analysis.

Wibowo, Marsha [173] see Plattner, Paige

Wichlacz, Caitlin (Arizona State University)

[17]

2D Geometric Morphometric Analysis of Ceramic Vessel Profiles from Phoenix Basin Hohokam Sites

Two-dimensional profile drawings of whole and reconstructible ceramic vessels were routinely made during archaeological projects in the Phoenix Basin in recent decades, creating a valuable archive of 2D shape information. The overwhelming majority of these whole and reconstructible vessels were recovered from mortuary contexts and have since been repatriated, precluding additional analysis of the original objects. Archaeologists working at Pueblo Grande in the early 1990s recovered, documented, and analyzed over 2,000 whole and reconstructible vessels, giving substantial attention to considerations of vessel morphology, but their classification and analyses of vessel forms are not unproblematic, and new questions prove difficult to address with existing data. This work tests the feasibility of using 2D geometric morphometric analyses of archival vessel profiles to reevaluate vessel form classifications from Pueblo Grande in order to aid in asking new questions of the dataset. Because of the large amount of additional data recorded for these vessels during the Pueblo Grande project, relationships between vessel shape and numerous other characteristics can be tested and compared to existing models of ceramic production and exchange for the area. A smaller collection of archival vessel profiles from the site of Las Colinas is similarly evaluated and compared.

Widmer, Randolph (University of Houston)

[152]

Discussant

Widmer, Randolph (University of Houston)

[181]

Discussant

Wiedenmeyer, Emilie [215] see Friend, Sadie

Wieland, Spencer (University of North Carolina, Greensboro), Donna Nash (University of North Carolina, Greensboro) and Emily Schach (University of California, Santa Cruz)

[5]

Semi-Precious Stones at the Wari site of Cerro Baúl

Our poster will present the results of pXRF analysis conducted to identify and source semi-precious stones from the Wari site of Cerro Baúl. The Wari Empire existed from approximately 500–1000CE in what is now Peru. The sample includes 118 green stones (most likely Chrysacolla), 111 blue stones (most likely Sodalite), and 45 pieces of what is possibly local onyx. These items represent lapidary objects or production debitage recovered during excavations of Cerro Baúl. We also analyzed reference samples from other locations in the Andes. The data collected from pXRF will allow us to more accurately identify the stones present at Cerro Baúl. We

will also compare the chemical composition of stones from Cerro Baúl to the stones from other sites. This comparison will be done to see if pXRF can be used to identify the source of stone materials found in an archaeological context. These stones were part of a vast network of goods accessible to Wari elites from within their empire and abroad. Tracking the movement of these materials can shed light on the political economy of the Wari by increasing our understanding of how raw materials were sourced and transported for the production of prestige goods.

Wiewel, Adam

[107]

Twenty-First Century Archaeological Geophysics in the National Park Service

The Midwest Archeological Center (National Park Service) has long been at the forefront of geophysical surveys for archeological research and heritage management in the United States. Since the Center's pioneering efforts to showcase the practicality of geophysical methods nearly 50 years ago, our use of ground-based surveys has become indispensable for documenting, understanding, and preserving archeological resources. I will discuss significant findings from recent projects to illustrate how geophysical surveys facilitate communication with our partners and the public and also inform our understandings of the past. These case studies include (1) our use of GIS methods and spatial statistics to create intuitive visualizations of gradiometry survey results at a multicomponent Woodland site in Iowa significantly impacted by decades of cultivation; (2) a multi-instrument survey at Wright-Patterson Air Force Base in Ohio to identify the remnants of a historic community forced to move following the Dayton Flood of 1913, a site of considerable interest to resource managers and the local public; and (3) our assessment of the National Historic Landmark designation of an Initial Coalescent fortified village in South Dakota based on a gradiometry survey, the results of which also reveal new information with historical implications for the site's fifteenth-century occupants.

Wigley, Sarah (Center for Archaeological Research, University of Texas, San Antonio)

[194]

Hunter-Gatherer Mobility at the Granberg Site (41BX17), Bexar County, Texas

This paper examines the mobility patterns of hunter-gatherer groups inhabiting the Granberg site as reflected in the recovered lithic assemblage. The site, located in Bexar County in the Middle Salado watershed, contains significant quantities of chipped stone, multiple burned rock features, and several burials that evidence multiple occupations throughout the Archaic period. It has been the subject of numerous archaeological investigations, from 1963 through 2006. Using various measures of debitage and lithic tools from selected dated proveniences at the site, this paper examines potential changes in site use throughout the Archaic. Measures on debitage, including flake measurement ratios, flake completeness, and cortex, as well as ranges of variability in raw material of debitage and tools, reflected in color analysis and UV fluorescence, suggest that mobility strategies at the site may have shifted from a residential emphasis in the Early Archaic to a more logistically focused strategy in the Late Archaic.

Wiig, Øystein [64] see Szpak, Paul

Wilcox, Michael [184] see Lippert, Dorothy

Wilcox, Timothy [41] see Campbell, Wade

Wilde, James (AF Civil Engineer Center) and Amy Williams (U.S. Army Corps of Engineers)

[132]

Collaborating on Contingency Operations: A Reconnaissance Archaeological Survey of Air Base 201 in Niger

In 2017, the U.S. Air Force Civil Engineer Center (AFCEC) requested archaeological assistance from the U.S. Army Corps of Engineers' Mandatory Center of Expertise (MCX) for the Curation and Management of Archaeological Collections (CMAC) to support a project in Niger, Africa. This collaboration led to a survey of over 1,200 acres of Airbase 201 (AB 201) near Agadez, where culturally sensitive materials had been identified. This paper focuses on the successful collaboration between AFCEC and MCX CMAC, which resulted in an update to AB 201's cultural resources management plan, the modification of training and visual aids for airmen on AB 201, and the recovery of several Acheulean hand axes and the recordation of burials for avoidance.

Wilhite, John (University of Memphis)

[47]

An Iconographic Analysis of Negative Painted Effigy Bottles at Tyler Mound

Negative painted ceramics are rare and sit squarely on the frontier of our understanding of Mississippian ritual, but they potentially hold valuable information concerning cosmology, as well as ritual institutions. In this paper, I interpret the black bands with white dots, a design found on negative painted ceramics at the Tyler Mound, as motifs depicting souls traveling along the Path of Souls. These motifs typically accompany swirls and petaloid designs on human effigy (hooded) bottles. By comparing design fields on these vessels with previous interpretations of motifs from other Mississippian sites, in addition to employing the ethnographic record of Prairie and Southeastern groups, I further elaborate the probable Mississippian concept, or concepts, of the soul. Negative painted effigy bottles at the Tyler Mound site illustrate how Mississippians conceptualized and depicted their concept of life forces or souls.

Wilkes, Margaret (NPS Northeast Region Archeology Program)**[107]***NPS Northeast Region Archeology Program Remote Sensing: An Integrated Approach to Archaeological Research*

The Northeast Archeology Program (NRAP) has engaged in geophysical surveys since the 1980s. Rarely is there a park in the region, that extends from Maine to Virginia where Bruce Bevan has not been; establishing not only a standard for baseline inventory evaluation, but setting a precedence for the application of remote sensing in NRAP's archeological investigations. Over the past 40 years NRAP has developed the expertise to engage in increasingly high resolution surveys as part of Section 106 compliance and Section 110 baseline inventory and evaluation work. Projects focus on baseline inventory but also include critical themes that address cases of climate change impact, lesser told stories of Park landscape occupation and use, and always reveal new information to contribute to broader research hypotheses. This paper presents an overview of geophysical surveys, metal detecting, UAS mounted sensors and GIS in archeological inventory research through case studies across the region.

Wilkins, Crae [234] see Becker, Hilary

Wilkins, Jayne [11] see Collins, Benjamin

Wilkinson, Darryl (University of Cambridge)**[33]**

Chair

Wilkinson, Darryl [33] see Wilkinson, Toby

Wilkinson, Toby (University of Cambridge), Darryl Wilkinson (Dartmouth College) and Adam Green (University of Cambridge)**[33]***A Triadic Model for Transportation in Ancient Civilizations*

A socio-transport system manifests the collective capacity of an ancient civilization to move humans, goods, and information across the landscape. Technology and environment shape these systems, setting the energy requirements of social interaction, and impacting the spatial arrangement of human activities, and thus exerting a powerful influence on politics and economies. Ancient civilizations inhabited mountains, seas, and riparian corridors, each of which exerted particular pressures on socio-transportation systems. This paper presents a novel schema for classifying, analyzing and visualizing socio-transportation systems using computational tools. Our aim is to model interrelations between socio-transport systems and other social variables, integrating them into an explanatory framework. We identify three basic facets of socio-transport systems: terrestrial, aquatic linear, and aquatic radial. Terrestrial systems required human or animal portage, with high incumbent costs. Aquatic transport systems massively reduced transport costs, especially for bulky items, but they were not all the same. Aquatic linear systems were usually riverine, such as in early Egypt; and aquatic radial systems were oceanic, lacustrine, or braided riverine contexts, as ancient Indus or Amazon, or the Aegean in the extreme. Our proposed triadic model may reveal regularities in these systems interacted with other aspects of social structure.

[33]

Chair

Wilkinson, Toby [33] see Green, Adam

Wilks, Stefania (University of Utah), Lisbeth Louderback (Natural History Museum of Utah, University of Utah) and Shannon Boomgarden (Natural History Museum of Utah, Range Creek Field)**[245]***Identification of Water Regime Influence on Zea Mays in Range Creek Canyon Based on Starch Grain Morphometrics*

Starch grains of *Zea mays* (maize) have been well-studied during the last few decades, providing a wealth of information on global patterns of human subsistence and plant domestication. Very little work, however, has been conducted on how the size and morphology of the grains might change if exposed to different environmental contexts (e.g., the amount of water parent plants receive). This poster session examines the costs and benefits of irrigation to growing maize at Range Creek Canyon in central Utah. Our study seeks to determine if there are significant changes in the size or morphological attributes of starch grains from maize planted at Range Creek under different irrigation regimes (low, moderate, ample). Two varieties of maize (Pima and Tohono O'odham) from three different source populations were examined to develop starch reference material. Range Creek grains grown under the three water regimes were then measured and compared to reference grains. Our results provide data on the impact of irrigation on the size and morphology of starch grains and, therefore, have implications for identifying archaeological maize and possibly determining past water regimes at Range Creek Canyon.

Wilks, Stefania [245] see Boomgarden, Shannon

Wilks, Stefania [235] see Louderback, Lisbeth

Will, Manuel (University of Tuebingen) and Nicholas Conard (Department of Early Prehistory and Quaternary Ecol)**[11]***Regional Temporal Signatures in the Howiesons Poort Support Complex Patterns of Behavioral Evolution in the Middle Stone Age*

of Southern Africa

The Howiesons Poort (HP) of South Africa plays a key role in scenarios on the early cultural evolution of *Homo sapiens*. Many models portray the HP as homogeneous technocomplex, but recent work has uncovered increased variability. We focus on diachronic variation within the HP and its implications for the behavioral evolution of modern humans. Based on high-resolution quantitative data on HP lithic assemblages from Sibudu, we test previous assessments of the technocomplex at the site and regional level. Significant variability and consistent unidirectional change characterize the Sibudu sequence, with gradual reduction in blade proportions, backed pieces, and HP cores. These changes conform to biased cultural transmission within demographic continuity, but also covary with shifting hunting patterns and landscape opening. Quantitative comparisons with seven HP sites in South Africa from various geographical and ecological zones reveal temporal trends that vary in an intricate and opposing manner between, and sometimes within, regions instead of parallel diachronic changes. These regional patterns are associated with different ecological adaptations and different connection networks, but the complex nature of temporal changes in lithic attributes across sites precludes mono-causal explanations. Our findings reinforce scenarios of regionally variable and historically contingent trajectories of behavioral evolution for the MSA.

Williams, Alexandra [177] see Tomich, Kassi

Williams, Amy [132] see Wilde, James

Williams, Charles

[175]

Lidar Prospection Uncovers the Forgotten Industrial Forest of the Shipperville Furnace, Northwestern Pennsylvania
Clarion County was a leader in historic iron production in northwestern Pennsylvania during the mid-nineteenth century with 31 furnaces operating from 1829–1882, of which 28 used charcoal as fuel. Shipperville Furnace, Clarion County, was a water-powered, hot-blast charcoal iron furnace in blast from 1832–1859, a span of 27 years. As part of a larger study of colliers and historic charcoal production in Clarion County, I used lidar imagery to identify putative relict charcoal hearths (RCH) within an 8.5 km² forested study area adjacent to the furnace. Ground surveys were used to confirm or refute putative RCH identification. Of the 25 putative RCHs selected for ground survey, 21 (84.0%) were confirmed by soil coring. RCHs exhibited the slope discontinuity and circular platform morphology typical of cut-and-fill construction and were largely located on gentle slopes and plateaus (mean slope = 3.1%). Mean diameter of RCHs was 13.5 m; mean distance to nearest hearth was 126.2 m. Soil cores from all RCHs showed a single A horizon of charcoal dust and fragments, indicating that each had been fired only once. Lidar imagery is currently being used to uncover other features of the charcoal-making complex at Shipperville Furnace, particularly collier huts and haul roads.

Williams, Charlotte [57] see Smit, Douglas

Williams, Daniel [78] see Belcher, Megan

Williams, David [172] see Lamie, Katherine

Williams, John [235] see Perrotti, Angelina

Williams, Megan (University of Calgary), Elizabeth Paris (University of Calgary), Roberto López Bravo (Universidad de Ciencias y Artes de Chiapas,) and Gabriel Lalo Jacinto (Instituto Nacional de Antropología e Historia)

[203]

Obsidian Production and Exchange at Tenam Puente, Chiapas, Mexico

Obsidian has long been utilized across the Maya world, both spatially and temporally, and is found at archaeological sites throughout Mexico, Belize, Guatemala, and Honduras. Worked by skilled craftsmen into prismatic blades, projectile points, scrapers, biface tools, ear spools, mirrors, and decorative ornaments, the morphological and compositional analysis of the obsidian assemblage from an archaeological site can tell us much about the economy, prosperity, and daily life of its inhabitants. This paper examines an obsidian assemblage from the Maya site of Tenam Puente in the highlands of Chiapas, Mexico. Established in the Classic Period (AD 300), and occupied through the Early Post Classic period (AD 900–1200), Tenam Puente has been excavated extensively since 1992, with the most recent 2019 field season focusing on the previously unexcavated Main Plaza next to the site's principal ball court. This paper discusses the results of morphological study and X-ray Fluorescence analysis of the obsidian assemblage from these excavations, and offers insight into the nature of industry, marketplace, trade, and economy at Tenam Puente during the Postclassic Period.

Williams, Ryan (Chicago Field Museum) and Donna Nash (UNCG)

[86]

Wari Beer: Production as Practice at the Cerro Baul Brewery

Between 600 and 1000 AD, the Wari state expanded across the Andes. Wari beer was one of the quintessential ways in which Wari identity was promoted in provincial centers hundreds of kilometers from the Ayacucho heartland. Based on excavations at the far southern provincial Wari brewery at Cerro Baul, we take a *chaine opératoire* approach to beer production to evaluate the nature of

Wari brewing as state practice. We investigate each step of the brewing process, from ceramic container manufacture, through plant processing, mashing, and fermentation in different spatial venues at Cerro Baul used in the production of Wari chicha de jora y molle. This method provides us with insights into the practice of Wari state brewing and into the corollary activities being undertaken in the same spaces. In so doing, we establish the nature of craft production of beer-making in Wari state contexts and how it is differentiated from contemporary and later household contexts of beer production in the region.

Williams, Ryan [127] see Sharratt, Nicola

Williams, Thomas (University of Texas, Austin), Ciprian Ardelean (Autonomous University of Zacatecas) and Nancy Velchoff (University of Texas, Austin)
[73]

The Ballad of Bruce Bradley: Tales of Teaching and Knapping on the Job

Bruce Bradley's willingness to engage with all students should rank highly in his contributions to archaeology over the past 50 years. His personal approach to research, his understated but ever-present search for evidence in lithic technologies and the need for science to lead the way, has always spilled out into his teaching. From debating the early origins of people in the New World, to how to apply experimental archaeology in the service of scientific reasoning, he has always been willing to share his knowledge. The authors of this paper came into Paleoamerican archaeology via different routes, but eventually found Bruce, who inspired them to research the early prehistory of the Americas. We discuss how Bruce impacted on our research and continues to help and advise us. It is his knowledge, expertise, open mindedness, and passion that has helped and inspired us and many others, directly and indirectly.

Williams, Thomas (University of Texas, Austin)

[170]

Discussant

[170]

Chair

Williamson, James (Memorial University Newfoundland)

[12]

Beothuk Housepits in Virtual Spaces

In 1964, an amateur archaeologist Don Locke gave the the Provincial Archaeology Office of Newfoundland a record of the locations for more than 100 Beothuk housepits along the Exploits River Valley. Since then, more housepits have been located but never fully recorded. My research has focused on recording these features using image-based modeling and the analysis of the 3D models. Focus was put on finding the best method for acquisition and processing in photogrammetry. Following that, advanced visualization methods for 3D models to recognize features within housepits must also be discussed. The results of these techniques will be discussed, focusing on the morphology of the exteriors and the topography of the interiors of the house-pits. This will show how digital methodologies can be used to record and analyze residential features nondestructively and demonstrate that there are more internal features than previously thought, including hearths and benches. This suggests that prior beliefs about the paucity of Beothuk features may be incorrect and points toward new avenues for study.

Williamson, James [12] see Holly, Donald

Williamson, Kylie (University of Florida), Neill Wallis (Florida Museum of Natural History), George Kamenov (University of Florida) and John Krigbaum (University of Florida)

[80]

Osteological and Isotopic Analysis of the Pillsbury Burial Mound (AD 600–900), a Weeden Island Site Situated along the Gulf Coast of Florida

Since the excavation of its type site in Tampa, Florida, much variation has been observed regionally for sites associated with the Middle Woodland phenomenon known as Weeden Island. Materials analysis of characteristic pottery demonstrates extensive extra-local connections at Weeden Island sites, indicating large scale interactions particularly centered around burial mound rituals. This research seeks to further explore the nature of region-wide interactions and community formation processes by means of osteological and isotopic analyses of human remains from the Pillsbury Burial Mound site just north of Sarasota, in Bradenton, Florida. The site consisted of a temple mound and adjacent burial mound, and was in use from ca. AD 600–900. Osteological analysis of the remains yields a minimum of 199 individuals dispersed across 143 burials. Isotopic analysis is aimed to clarify individual life history focused on first molar, third molar, and bone fragment remains, and data collected will be interpreted against previously analyzed Weeden Island sites. Preliminary isotopic analysis suggests a mixed dietary regime including marine and riverine-based foods. This study seeks to expand on previous analyses to include life history data to elucidate the processes of community formation and better situate Pillsbury Mound in the larger Weeden Island religious complex.

Willis, Kelsey [126] see Neff, Hector

Willis, Mark (Flinders University) and Satoru Murata (BREA)

[14]

Mapping of the Largest Inland Perennial Wetland in Belize

During the summer of 2016, large scale Unmanned Aerial Vehicle (UAV) mapping was conducted in the Western Lagoon near Crooked Tree, the largest inland perennial wetland in all of Belize. Our aim was to record a series of linear features in the wetlands that may represent ancient Maya canals and other features possibly related to transportation, irrigation, aquaculture, and agricultural production. The aerial survey, comprising over 44 km², is the largest ever conducted in Belize with a UAV. The logistics of this large-scale aerial survey will be presented along with our preliminary findings and interpretations of these features. Excavations carried out in subsequent field seasons are aimed at testing some of these hypotheses.

Willis, Mark [79] see Castañeda, Amanda

Willis, Sam [194] see Bajdek, Brennan

Willis, William (University of Nevada, Las Vegas) and Elizabeth Shikrallah (University of Nevada, Las Vegas)

[148]

What Do Small Sites Tell Us about Virgin Branch Puebloan Lifeways on the Shivwits Plateau?

Recent archaeological work on the Shivwits Plateau in Northern Arizona has focused on the distribution and purpose of small habitation sites among the Virgin Branch Puebloan culture. Preliminary data suggests that these small sites contain a high degree of variation in terms of their placement on the landscape, and their function in Virgin Branch society. This research looks at some of this variation within the context of how the Virgin Branch interacted with their environment to buffer against ecological risk.

Willison, Megan (University of Connecticut)

[13]

Trade and Settlement in Seventeenth-Century Connecticut

Following some of Dr. Brian Jones' recent research interests in the archaeology and history of seventeenth-century Connecticut, this paper will explore three seventeenth century Pequot domestic sites dated to between 1611 (the arrival of the Dutch) and 1637 (the conclusion of the Pequot War of 1636–1637) and one Euro-American homestead excavated by Dr. Jones that dates to the mid- to late seventeenth century. The three indigenous domestic sites, along with two others nearby, represent the "largest assemblage of early seventeenth century indigenous sites associated with a single Native group ever identified in southern New England" (McBride et al. 2016:20) and contain a diverse array of trade objects. This paper will discuss the diagnostic artifacts recovered from each site and discuss the implications of trade and settlement for both indigenous constituents and Euro-Americans in the seventeenth century.

Wilshusen, Richard (PaleoCultural Research Group)

[98]

Discussant

Wilson, Danee [240] see Fitzpatrick, Leslie

Wilson, David (Florida State University)

[270]

Stable Isotope Analysis of Megafaunal Materials from Paleoindian Sites in the Southeast United States

Excavations at Page-Ladson (8JE591) and other sites in the southeast United States have recovered zooarchaeological artifacts of megafauna species including Pleistocene camel and mastodon. Tusk and tooth samples from these individuals have been subject to Carbon and Oxygen stable isotope analysis to determine individual diet and water consumption. The preliminary data indicates a possible seasonal water/food resource rotation and differences in food consumption between the species. The findings provide additional insight to the seasonal availability of these species on the landscape for human exploitation, as well as the seasonal availability of floral and water resources on the landscape during the Pleistocene.

Wilson, David [196] see Kilikoglou, Vassilis

Wilson, Douglas (Portland State University/National Park Service), Theresa Langford (National Park Service) and Meagan Huff (National Park Service)

[172]

Navigating Museum Collections and Archaeological Research at Fort Vancouver

Since 1947, the National Park Service and its collaborators have excavated at Fort Vancouver, a nineteenth-century fur-trade and U.S. Army colonial site in the Pacific Northwest of the United States. Museum collections are dominated by archaeological collections from indigenous and colonial sites from the National Historic Site and related, affiliated sites. Challenges to collections management include refining and sampling in the face of interest from multiple stakeholders, including academic and indigenous communities, and changing theoretical directions in archaeology. The lessons from 20 years of collaboration between archaeologists and museum curators suggest that museum curators should assist in the formulation of archaeological research designs, including the development of protocols for artifact sampling to avoid future issues with deaccessioning. Developing proactive protocols for collections management that address archaeology is particularly important for park units with collections that do not have permanent staff archaeologists and/or curators.

Wilson, Gregory [211] see Bardolph, Dana

Wilson, Jeremy (Indiana University-Purdue University, Indianapolis), Grace Bocko (Indiana University-Purdue University, Indianapolis) and Olivia Messenger (Indiana University-Purdue University, Indianapolis)
[167]

The Bioarchaeology of Bethel Cemetery: Dying, Death, and Demographic Transitions in Nineteenth-Century Central Indiana
During the 2018–2019 Bethel Cemetery Relocation Project, 543 individuals were exhumed with 507 subsequently undergoing osteological analyses by bioarchaeologists at the University of Indianapolis and Indiana University Purdue University Indianapolis (IUPUI). In this presentation, we review the scope, protocols, methods, and procedures utilized during the skeletal analyses, focusing on the development of biological and taphonomic profiles for each individual, as well as the challenges and opportunities related to ongoing and future research. We then shift our focus to the extraction of demographically meaningful information from this predominantly nineteenth century cemetery, comparing the adult mortality profiles for Bethel Cemetery derived from the osteological analyses to the data obtained from the cemetery's legible headstones. We also compare the skeletal-derived mortality models to proxy data on deaths and causes of death collected as part of United States Censuses between 1840 and 1890. Our preliminary results indicate that important paleodemographic insights can be obtained when utilizing appropriate techniques, comparative data, and mathematical models. Furthermore, our results suggest that Bethel Cemetery was in use during the onset of an important second demographic transition characterized by attenuated age-specific risk of death among adults.

Wilson, Jeremy [232] see Flood, John

Wilson, John [124] see Langlie, BrieAnna

Wilson, Kurt (University of Utah), Brian Coddling (University of Utah) and Joan Coltrain (University of Utah)
[61]

Exploring the Intersection of Climate, Society, and Diet in the Prehistoric Andes
Diet influences many social interactions, yet the role of subsistence in structuring our social worlds is often underappreciated. To help integrate studies of subsistence and social dynamics, here we investigate how dietary decisions vary as a function of climate and social inequality across the Peruvian Andes and northern Chile. Identifying dietary changes possibly driven by climate enables the examination of how subsistence mediates social interactions, and allows for the identification of residual variation in diet that may be better explained by social status, gender, or other social constructs. Using a comprehensive database of carbon and nitrogen isotope data for individuals from the Peruvian Andes and northern Chile ($n = 1570$) we compare dietary changes over space and time with climate reconstruction derived from TraCE-21ka. Statistical analysis of co-variance in climatic and dietary change reveals relationships with environmental shifts which may serve as a baseline for analysis on gender, age, and other demographic factors.

Wilson, Jeremy [167] see Powell, Allie

Winchell-Sweeney, Susan [190] see Lothrop, Jonathan

Winkler, Stephan [11] see Fisher, Erich

Winter, Barbara [203] see Cannon, Molly

Winter, Marcus [39] see Minc, Leah

Wiseman, Chelsea [238] see McCarthy, John

Witham, Samuel [252] see O'Mansky, Matt

Witmore, Christopher (Texas Tech University) and Bjørnar Olsen (UiT—Arctic University of Tromsø)
[159]

Svaerholt, WWII History, and Archaeology
What difference does an archaeological approach make to a period saturated by history? Since 2011 a group of archaeologists have undertaken fieldwork at a WWII prisoner of war camp at Sværholt in northernmost Norway. The labor camp for Soviet prisoners was established in 1942 as part of the construction of the German coastal battery at Sværholt, a fortification within the Atlantic Wall. In late fall 1944 the camp, the coastal fort, and the local Norwegian hamlet were abandoned and destroyed in step with the massive and abrupt German retreat from this northern region. This paper explores the afterlife of the camp and the coastal fort and shares details of the excavation and archaeological finds. In weaving a path alongside objects revealed over the last nine summers at Svaerholt this paper indicates how the things found challenge our common assumptions about the relationship between

prisoners, guards, and locals. Ultimately, it provides suggestions as to what an archaeological account may look like as a complement and alternative to history.

Witt, David (NYS Department of Environmental Conservation)

[77]

Remote Sensing of Chacoan Roads in the Middle San Juan Region

This poster demonstrates recent applications of remotely sensed data to track Chacoan roads in the Middle San Juan Region, specifically the use of high resolution (1 meter) Digital Elevation Models obtained from Light Detection and Ranging (lidar) data and multispectral imagery obtained from the Advanced Spaceborne Thermal Emission Reflectance Radiometer (ASTER) instrument to track a potential route between the Aztec Community and the Holmes Group through the Farmington Glade and surrounding mesas. These data sources, in combination with historical aerial imagery, spaceborne orthoimagery, and archaeological site data obtained from the New Mexico Cultural Resources Information System (NMCRIIS), allow for the continued development of a geographic record for potential Chacoan roads that is ready for ground truthing.

Witt, David (NYS Department of Environmental Conservation)

[154]

Discussant

Witt, David (NYS Department of Environmental Conservation)

[25]

Discussant

Witt, David [25] see Richards-Rissetto, Heather

Witte, Emilee, Donna Nash (University of North Carolina, Greensboro) and Emily Schach (University of California, Santa Cruz)

[260]

People, Pigments, and Parallels

The Late Intermediate Period is viewed as a time of collapse, when the Wari and Tiwanaku polities fragmented and new cultural traditions emerged. In this paper I use portable X-ray fluorescence (pXRF) to examine changes from the Middle Horizon to Late Intermediate period in the availability and use of slip pigments and colorants. Pigments are essential to polychrome pottery production seen in the varying cultural traditions being studied. The knowledge of production was transferred between communities. The spread of ideas followed social networks and led to the development of new communities of practice. I will describe changes and continuities in the use of pigments in the Moquegua region and discuss the implications these results have for understanding the transmission of craft knowledge and the scope of exchange networks from the Middle Horizon to Late Intermediate period.

Woldekiros, Helina (Washington University, Saint Louis)

[33]

Donkeys, Mules, Camels, and Caravans: Aksumite (400 BC–900 CE) Terrestrial Transport System in Northern Ethiopia

Pack animals played a significant role in shaping the world's earliest continental and regional terrestrial transport systems. Pack-based caravans, organized by the state or small-scale traders, facilitated the economic growth and political strength of complex ancient societies. This paper examines the organization of ancient Aksumite (400 BC–900 CE) salt transport on the Afar trade route drawing on recent ethnoarchaeological and archaeological evidence. Ethnoarchaeological research on the Afar salt trail provided data on traders and pack animal trains moving 160 km from the high Ethiopian plateau to the Afar salt source. The study sheds light on the daily rhythms of the trail, presenting data on drover feeding, harnessing, loading, and unloading, working and resting of animals. The data reveal that ancient and modern traders followed the least costly path on a portion of the route, with ideal slopes for pack travel and water sources, while brunching routes passed through trader towns as well as foothill towns. Radiocarbon date shows use of the trail during the Aksumite and Medieval period.

Wolfe, Allison (University of Utah)

[27]

The Bonneville Basin Avifauna

The final regression of Lake Bonneville during the Pleistocene/Holocene transition resulted in dramatic environmental changes in the Bonneville basin, followed by further environmental fluctuations throughout the Holocene. Recent research of faunal and floral remains throughout the basin has increased our knowledge of the corresponding biotic changes that occurred in the region. The dynamics of the region's avifauna, however, remain poorly understood due to a limited availability of avifaunal assemblages that cover this period. Homestead Cave is the only site within the basin that has produced a substantial, fine-grained avifaunal record that spans the past 13,000 years. Identification of the changes in taxonomic composition of the Homestead Cave avifauna throughout this long record allows for study of the response of certain taxa to shifts in different environmental factors. This analysis has important implications for the modern conservation and management of birds, including that of the Greater Sage-Grouse, which represents one of the most prominent and controversial wildlife conservation issues in western North America today.

Wolff, Christopher (University at Albany)

[23]

Is Maritime Archaic an Archaic Term? A Consideration of Terminology in Newfoundland and Labrador

The Archaic period of Newfoundland and Labrador is vaguely defined. It shares aspects with the Paleoindian period elsewhere because the "Maritime Archaic" peoples of the region were the first to colonize it (ca. 8000 BP) following the melting of the ice sheets. It differs in that it does not fit the historical Paleoindian timeframe and because the Maritime Archaic developed a coastal economy and technology unlike the terrestrial assemblages associated with traditional views of Paleoindians. However, characteristics that define the Archaic period elsewhere, such as broader subsistence strategies, territoriality, and greater sedentism, are rare in the early Archaic period of the region. Moreover, near the end of the Archaic period, there are no changes from a highly mobile, hunter-gatherer society that traditionally defines Woodland periods elsewhere. There are some shifts to a more generalized economy, larger residential groups, and more reliance on terrestrial fauna, but those traits elsewhere define "Archaic" periods instead of distinguishing them from later periods. With this in mind, this paper will ask if the term "Archaic" in Newfoundland and Labrador is useful? Is it just a chronological marker or something more important, and does it fit with traditional ideas of what it means to be "Archaic"?

[23]

Chair

Wolff, Christopher [12] see Holly, Donald

Wolff, Christopher [72] see Yakabowskas, Dana

Wolfhagen, Jesse (Stony Brook University)

[55]

Why Not A Bayesian Archaeology? Debunking Misconceptions about Bayesian Statistics

Bayesian inference has become a popular framework for statistical analyses across scientific fields in the past several decades, thanks to the development of software for generalized or specialized Bayesian modeling. With the logistical barriers to Bayesian inference becoming less onerous, a wide variety of Bayesian applications have started to appear in scientific fields, including archaeology. While increased exposure to myriad applications normalizes Bayesian statistics in archaeology, misconceptions about the nature and application of Bayesian methods to archaeological problems remain and get in the way of broader and creative applications in the field. Here, I explore and attempt to correct misunderstandings about 1) prior distributions, 2) how Bayesian statistics is performed, and 3) when is a Bayesian approach appropriate. By reducing anxieties surrounding the proper use of Bayesian statistics in archaeology, I hope to encourage further use of this approach to explore a wide variety of archaeological questions and to normalize the use of Bayesian inference in our research and models.

[55]

Discussant

[55]

Chair

Wolterbeek, Leo [199] see van Gijn, Annelou

Wolters, Steffen (Lower Saxony Institute for Historical Coastal Research, Wilhelmshaven), Anja Behrens (Lower Saxony Institute for Historical Coastal Research), Moritz Mennenga (Lower Saxony Institute for Historical Coastal Research) and Martina Karle (Lower Saxony Institute for Historical Coastal Research)

[107]

Relicts under the Bog: Reconstruction of the Neolithic Landscape and Vegetation in the Ahlen-Falkenberger Bog in Northwestern Germany

In the bogs of northwestern Germany, the landscape of the Neolithic is preserved like only few other places in Europe. Due to agricultural bog cultivation for some decades, megalithic graves of the funnelbeaker culture (3400–3800 BC) are successively emerging from the moor. These monuments and their surrounding are now the focus of the research of the "Relicts under the bog" project, funded by the Ministry of Science of the federal State of Lower Saxony, Germany. Aiming to locate archaeological sites and indicators of the ancient landscape that is covered by bog, geomagnetic prospection on an area of about 600 ha was carried out. Although this area is positioned in a moraine landscape of the Saale glaciation and shaped by layers of inhomogeneous sediments with interspersed stones of varying size, it was possible to identify sites where so far unknown megalithic tombs may be expected. The geomagnetics were followed by archaeological investigations that allowed a detailed study of one megalithic grave and another lithic feature. The results confirmed that the graves covered with bog within a relatively short time after its construction. Additional archaeobotanical and geoarchaeological investigations were conducted that allowed detailed reconstruction of the ancient landscape and the bogs growths.

Wong, Amanda [183] see De Guzman, Margarita

Wong, Charmaine [186] see Duarte, Trever

Wong, Gillian (University of Tübingen), Dorothée Drucker (Senckenberg Centre for Human Evolution and Palaeoecology), Britt Starkovich (University of Tübingen) and Nicholas Conard (University of Tübingen)

[162]

Heterogeneity in Late Glacial Environments of Southwest Germany and Implications for Magdalenian Settlement

During the Late Glacial (~18–11.6 k cal yr BP), Magdalenian peoples recolonized southwest Germany, which was uninhabited during the Last Glacial Maximum. Past research has generally characterized this region as tundra during this time but making

smaller-scale interpretations can be difficult due to the nature of the fossil record. To tackle this problem, we pair stable isotope analysis of large ungulates with the analysis of a micromammal assemblage from Langmahdhalde, a Magdalenian site in the Swabian Jura of southwest Germany. We apply two bioclimatic models to the micromammal assemblage to predict several climate variables, including temperature and length of vegetative activity period. Additionally, we present carbon and nitrogen stable isotope data from bone collagen of reindeer and horse. We reconstruct a mostly tundra environment with pockets of denser vegetation, including trees, and argue that this heterogeneous environment was likely more productive and had a higher diversity of species than modern tundra environments. This may have been one of the reasons that Magdalenian settlement was successful in this region and may, at least in part, explain the regional nature of Central European settlement strategies during this time.

Woo, Katherine (University of Sydney), Peter Moe Astrup (Moesgaard Museum), Jonathan Benjamin (Flinders University) and Geoff Bailey (University of York)

[252]

To Shell with It: the Zooarchaeological Analysis of a Submerged Ertebølle Midden

Coastal environments have long been acknowledged as important resources for past peoples and middens are one of the most prevalent site types in these areas. Shifting sea-levels have resulted in many of these prehistoric coastlines being submerged, leaving a distorted record from terrestrial sites that have traditionally been used to reconstruct past landscapes and their functions. The examination of submerged palaeolandscapes, however, has become more prominent and provides archaeologists with the ability to address this current bias in the coastal record. Recent zooarchaeological analyses conducted on a submerged, early Ertebølle midden site at Hjørnø Vesterhoved, Denmark, appear to indicate that the mollusc assemblage follows a different trend to what has been examined in terrestrial middens for the region. This suggests a need to re-evaluate our current models for the region and to consider the unique taphonomic issues with examining submerged midden sites.

Woo, Katherine [18] see Hale, Nathan

Wood, Marilee (Honorary research associate University of the Witwatersrand)

[249]

Zanzibar's Seventh- to Tenth-Century Glass Beads Reveal a World Connected by Trade

Glass beads first arrived in eastern Africa in large numbers beginning in the seventh century CE. An in-depth study of these beads, including chemical analysis of the glasses used to make them, provides insights into where the glasses were produced, where the beads were possibly made, what trade patterns brought them to Africa and how these patterns were affected by political events, particularly in regions where the glasses and beads were made. The beads recovered from Sealinks Project excavations at Unguja Ukuu in Zanzibar are well suited to explore trade connections in the Western Indian Ocean between the seventh and mid-tenth centuries. It appears that traders carrying beads made of a mineral soda glass from Sri Lanka were the first to arrive in Zanzibar followed soon after by traders from the Persian Gulf who carried beads made of a plant ash glass that was probably produced in Iraq. But this glass type was widely traded so the beads may have been made at far-flung places, from southern Africa to Gao in Mali or from Thailand to Scandinavia. These beads show how interconnected the Old World was in this Early Islamic Period.

Wood, Warren [18] see Damour, Melanie

Woodard, Buck [251] see Moretti-Langholtz, Danielle

Woodfill, Brent (Winthrop University) and Lucia Henderson

[127]

Missing Persons: Animate Landscape and Nonhuman Persons in Ancient Maya Ritual Economy

In indigenous Maya belief, many landscape features are viewed as living, agentive beings. Human persons thus interact with a wide variety of nonhuman persons in their daily and ritual lives. Although scholars often cite the "living landscape" as an important feature of ancient Maya belief and religious practice, the manner in which this agentive landscape actively affected matters of economy, trade, and ideology is rarely addressed. This presentation contemplates the ways in which nonhuman persons—especially animated features of the landscape such as caves, lakes, mountains, and volcanoes—participated in ancient Maya ritual economy. Focusing particularly on trade and pilgrimage routes, the authors consider the ways in which nonhuman persons may have affected the logistics of ritual pathways and economic exchange, including the ownership, management, procurement, and transportation of goods and materials between sites and across regions. How did living landscape features interact with those living with them and passing by them? As persons, could these sites be owned, or did they serve as neutral nodes in contested territory? Overall, how does applying this indigenous, expansive view of personhood to the archaeological record affect scholarly theories related to economic systems and ritual practice?

[127]

Chair

Woodfill, Brent (Winthrop University)

[209]

Discussant

Woodfill, Brent [175] see Gillam, J. Christopher

Woodfill, Brent [168] see Leight, Megan

Woodhead, Genevieve (University of New Mexico)**[148]***Ordinary but Not Insignificant: Assessing the Symbolic Import of Embellished Ancestral Puebloan Utility Wares*

Why embellish the practical things we make? A focused approach to the study of utilitarian material culture is a necessary first step for answering this larger question of human behavior and erasing the false Western profane/mundane vs. sacred/holy dichotomy. This study looks at ceramic utility wares from the United States northern Southwest. Whole and partial Ancestral Puebloan corrugated cooking vessels often feature decorative appliques and intricate, basket-like surface designs. A close archaeological study, pulling from both art historical and statistical approaches to analysis, reveals the degree to which these embellishments were either systematic or haphazard. If orderly patterns emerge, especially within a localized ceramic tradition, then perhaps one could infer that even everyday objects were imbued with a certain symbolic significance.

Woodhead, Genevieve [149] see Schleher, Kari

Woods, Alexander (Colorado State University)**[52]***A Comparative Analysis of CRM Work Experiences on DoD Installations*

Cultural Resource Managers (CRMs) on military lands have developed different knowledge bases and encountered different challenges in their time balancing the needs of heritage management while simultaneously advancing the military mission. The diversity of people, environments, histories, and architectural styles on military installations leads to some of the variations in experience. These differences are compounded, however, by the diversity of weapon systems, land use patterns, housing arrangements, and workplace cultures across, and even within, different service branches. As a result, each military installation's CRM program has its own "flavor," much like the installations themselves. This paper presents an analysis of the results of qualitative surveys of CRMs across the DoD, and discusses emerging themes in their experiences running effective Cultural Resource Management programs on military lands.

[52]

Chair

Woodson, Kyle [229] see Morgan, Linda

Woodson, Kyle [229] see Plumlee, R. Scott

Woollett, James (Université Laval, Centre d'études nordiques) and Héloïse Barbel (Université Laval, Centre d'études nordiques)**[50]***From Omajuk to NiKik: The Variable Transformation of Animals into Social Things among the Historic Period Labrador Inuit*

Archaeological studies have conventionally regarded Inuit relationships to animals in terms of subsistence and food-getting, from seasonality and hunting strategies to calories of meat, fat and marrow consumed. Inuit oral traditions and ethnographic sources, however, offer a richer narrative of subsistence than archaeologists have succeeded in portraying, one including the ideological significance of animals, their spiritual autonomy and the multiple transformations of social meanings attached to animals during their appropriation, dismemberment and dis-embodiment. This study will re-examine seal, dog, fox and caribou bone across a set of historic period sites in Nunatsiavut (Labrador) in order to explore the potential of a social zooarchaeology of Inuit-animal interactions. As a starting point, differences in the treatment of live animals, and postmortem treatment of carcasses related to butchery, food preparation and other forms of exploitation were examined through comparisons of pathologies, cutmark and other tool marks in assemblages from midden, house floor and cache contexts, with different treatments clearly being accorded to different animals. These differences likely relate in part to functional variables such as anatomy and seasonality but also to conceptual distinctions between animals derived from ideology, habitus and the introduction of commercial trapping and hunting practices.

Woollett, James [50] see Marengère, Véronique

Wooten, Kimberly (California Department of Transportation)**[226]***The Biggest Anthropocene Site in the World: Using the Archaeology of Plastics to Engage in Public Education and Activism*

The world's oceans have become a dumping ground for plastic waste, perhaps creating the single largest archaeological site in the world. But what if we could teach people to see their plastic footprint in the Anthropocene Era? As a way to tackle this issue, eXXpedition launched a round-the-world research sailing voyage in October 2019. The mission of the two-year trip—which features 30 voyages, 300 women, and over 38,000 nautical miles—is to gather women from a wide array of nationalities and disciplines, creating "ambassadors" who will bring their understanding of single-use plastics back to their communities. Ms. Wooten joined the first leg of the research trip, over 1,200 nautical miles from England to the Azores, as an archaeologist. In preparation for her voyage, she developed guidance based on historical archaeology methods. In a way that is easy for the public to understand, she traces the development of the disposable economy and compares historically available materials such as ceramic, glass, and metal with their modern plastic descendants. This paper looks at the both the responsibility and opportunity for archaeologists to engage the public as activists and educators in seeking solutions to the Climate Crisis.

Worman, F. Scott (Missouri State University) and Elizabeth Sobel (Missouri State University)**[213]***"A rural backwater of poverty and illiteracy": Preliminary Investigations at the Phenix Town Site*

For nearly a century, books, movies, and other media have portrayed the Ozarks region as isolated, rural, and backward. During the summer of 2019, we led an archaeological field school investigating a company town constructed by the Phenix Stone and Lime Company in Southwestern Missouri. We documented remnants of public architecture, including the community hall, school, and church, as well as a barn and root cellars used by multiple families. We also identified architectural remains and domestic refuse associated with several households. In combination with our ongoing collection of oral histories and documentary research, the archaeological data are beginning to reveal a more complex and nuanced picture of life in the Ozarks during the late nineteenth and early twentieth centuries. Quarry workers and their families came from a wide range of backgrounds and re-shaped the demography of the area while participating fully in regional, national, and international economic networks. This project adds to our broader investigations of large-scale industrial production of lime, dimensional stone, marble, and other materials in the area, the environmental impacts of those industries, and the roles of race and class in mediating how economic change affected diverse households.

Worth, John [192] see Eschbach, Krista

Wright, David (University of Oslo), Ke Dong (Kyonggi University), Jonathan Adams (Nanjing University) and Helena Pinto Lima (Museu Paraense Emilio Goeldi)
[161]

Anthropogenic Landscapes in the Lower Xingu: Detection, Characterization, and Future

Recent archaeological research demonstrates unique niche construction activities across the Amazon associated with the formation and maintenance of terra preta and related anthropogenic soils. Advances in remote sensing technology and geospatial statistics have provided new opportunities to detect and quantify anthrosols in forested settings. This paper presents geochemical characterization of soils to provide insights into the nature and extent of precolumbian anthropogenic landscape formation in the lower Xingu basin. This research demonstrates that soil amendments induced significant microbial ecological shifts within the context of a closed canopy forest in a flattened-trophic environment. Prehistoric land use stands in marked contrast with modern landscape management practices, which are rapidly opening large swaths of rainforest for ranching and other agricultural pursuits. Additionally, drainage of wetlands during the historic period has been extensively documented in percussion cores taken in the vicinity of Gurupá, which further attests to diverging strategies of forest use over time. Modern agricultural practices threaten to tip the Amazon into a new, unprecedented ecological regime, which is unlikely to provide sustainable livelihoods for the majority of the forest's inhabitants unless the pace of deforestation is reversed.

Wright, Joshua (University of Aberdeen)
[62]

Chair

Wright, Kevin (The University of Alabama)
[3]

Examining Choctaw Coalescence through Ceramic Communities of Practice

This paper discusses the results of a study aiming to highlight the mechanics behind Choctaw coalescence in east-central Mississippi. A sample assemblage of eighteenth-century Choctaw ceramics from the Chickasawhay Creek sites (22KE630 and 22KE718) underwent both chemical and petrographic analyses. The results were used to identify ceramic communities of practice and to highlight social boundaries. A combination of indigenous and experimental archaeology was also used to help refine ceramic chronologies, highlight systems of trade and exchange, and explore the processes behind Choctaw identity formation.

Wright, Rita (New York University)
[143]

Discussant

Wright, Sterling (University of Oklahoma), Kristen Rayfield (University of Oklahoma), Courtney Hofman (University of Oklahoma), Andrei Soficaru (University of Southampton) and Adam Rabinowitz (University of Texas, Austin)
[169]

The Integrity of Biomolecules across the Oral Matrix from Histria, Romania

During the Archaic period (seventh century-sixth century BCE), Greek colonists from Miletus founded the city of Histria. Located near the Black Sea mouth of the Danube, this urban center experienced environmental and demographic changes during its 13 centuries of existence. The site has been under archaeological investigations for more than a century and has yielded a rich skeletal collection that is housed in the Fr. J. Rainer Institute of Anthropology in Bucharest. To assess biomolecular preservation at the site, this project applied metagenomic sequencing to two dental calculus and two dentin samples, as well as, proteomic analysis of sex-specific peptides to two dentin samples. All samples in this study date to the Roman imperial period. Our data suggest that ancient DNA and proteins are well-preserved at Histria. Microbial analysis suggests that calculus samples contain human-associated oral taxa and human genetic analysis reveals the presence of U5b2a5 and I3a haplogroups. Additionally, we were able to identify the sex for two individuals using minimally destructive proteomic methods. These results are encouraging and provide a direction for potential research on the skeletal remains from this site.

Wriston, Teresa (Desert Research Institute) and Kenneth Adams (Desert Research Institute)**[198]***Clovis in Coal Valley? Paleoindian points in the Basin and Range National Monument, Nevada and Their Relationship to Pluvial Lake Coal*

In 2016 DRI began a multi-faceted study of pluvial Lake Coal's history and how it relates to the earliest people in the region. This work was funded by the Lincoln County Archaeological Initiative administered by the Bureau of Land Management. In total, we surveyed 2,162-acres for archaeological evidence and examined many stratigraphic exposures for dateable remains. Of the seventy archaeological sites documented, twelve contain Crescents, Fluted (Clovis?), or Western Stemmed projectile points, suggesting that Coal Valley was a good place to be during the Terminal Pleistocene/Early Holocene. However, a shell age of about 16,084 cal yr BP in the highest shoreline, combined with Fluted points (n=5) discovered within a single site well below, suggests that people using Fluted points arrived after the lake began to recede. Western Stemmed points have a broader elevation distribution, from the top of the pluvial lake's highstand down to the site containing the Fluted points. In fact, within this dense site, Crescents, Fluted, and Western Stemmed points all intermingle. We don't know when people using Crescents and Stemmed points arrived, but we do know that they lived in the same place as people using Fluted points after the lake had retreated to the valley floor.

[198]

Chair

Wrobel, Gabriel (Michigan State University), Carolyn Freiwald (University of Mississippi) and Eleanor Harrison-Buck (University of New Hampshire)**[14]***Bioarchaeology of the Lower Belize River Watershed*

Burials from the BREA excavations represent a small, but diverse assemblage of mortuary contexts. Skeletal analyses have focused thus far on estimation of age and sex, as well as documentation of pathologies, trauma, and cranial and dental modifications. Additionally, isotopic analyses are underway, which will provide further information about burial dates, diet, and geographic origin. This paper will describe the current results generated from these analyses, and will utilize the biological and mortuary data to discuss the significance of the individuals within the broader context of the BREA research area of central Belize.

Wrobel, Gabriel [240] see Biggs, Jack

Wroth, Kristen [162] see Bousman, Britt

Wu, Dongming (Columbia University)**[94]***A Craft of Destruction: The Phenomenon of Bronze Scraping in Bronze Age China*

The practice of damaging objects of ritual importance is commonly seen in ancient civilizations. Through breaking burial goods or removing stele inscriptions, this practice diminished the original function and substituted it with a new meaning. Bronze vessels bore important ritual function in Bronze Age China, yet the decorations and inscriptions on bronze vessels were sometimes scraped off. This phenomenon is not limited to the bronzes plundered in wars when the names of the defeated were removed but can also be seen on those passed down in the same state, lineage, and family. In this sense, this phenomenon alludes that there existed a culture of manipulating the ritual meaning of bronzes through damaging and scraping, which was more complicated than simply erasing the memories of the previous owners. Therefore, it required the artisans to master not only the skill of bronze production but also the craft of destruction. This research discusses bronze scraping and its possible purposes by examining the bronze vessels demonstrating this phenomenon in the Zhou dynasty. It broadens the current study on this topic by introducing new archaeological evidence. This research points to the importance of destruction of ritual artifacts and the culture and craftsmanship of destruction.

Wu, Qian [45] see Zhai, Shaodong

Wu, Si [244] see Rayfield, Kristen

Wu, Yue [36] see Chen, Ran

Wyatt, Andrew (Middle Tennessee State University), Laura Furquim (Universidade de São Paulo) and Helena Pinto Lima (Museu Paraense Emílio Goeldi)**[161]***Archaeological Plant Remains from the Lower Xingu*

Recent archaeological excavations at the sites of Jacupí, Carrazedo, and Gurupá in the Lower Xingu in the Brazilian Amazon have implemented a significant program for the recovery of plant remains, resulting in a large archaeobotanical assemblage currently undergoing analysis. Recent archaeobotanical research in Amazonia has focused on and identified large-scale processes of environmental change, domestication, and agricultural practices; however, archaeobotanical studies to identify more local and short-term environmental and cultural processes are less common. The analysis of plant remains from these smaller and more local sites can provide information on local environmental change, plant use, and also provide insight into the process of the manufacture of Amazonian Dark Earths (ADE). In this presentation, we will discuss the preliminary results of our analysis of the archaeobotanical remains from these sites, and situate the data within the local environmental context of this region. In particular, we will discuss the

plant remains recovered specifically from ADE contexts and suggest possible techniques for ADE manufacture.

Wyckoff, Don [23] see Lohse, Jon

Wygall, Brian (Adelphi University), Kathryn Krasinski (Adelphi University), Charles Holmes (University of Alaska, Fairbanks), Barbara Crass (Museum of the North) and Dominic Tullo (University of Nevada, Reno)
[82]

The Holzman Site: Fourteen Thousand Years of Human Activity along Shaw Creek, Alaska

The Holzman archaeological site lies along the west bank of Shaw Creek, a northern tributary of the middle Tanana River in Interior Alaska. Recent excavations have yielded an expedient stone technology alongside well-preserved hearths, avifauna and large mammal remains including abundant mammoth ivory in deeply buried deposits. Evidence of food preparation and ivory tool manufacture has been dated to at least to 13,700 cal BP. A smaller occupation at the site, uncovered in 2019, dates to 14,000 years ago making Holzman one of the earliest sites in the Americas. A multidisciplinary team conducting wide-ranging analyses has contributed to our understanding of the human activities and local environmental change in this region—rich in Paleolithic archaeology.

Wygall, Brian [82] see Holt, Evan

Wyllie, Cherra
[191]
Chair

Wyllie, Cherra
[227]

Cerro de las Mesas Monument 2

Cerro de las Mesas Monument 2 is a colossal portrait head. Its flattened rear surface contains a relief-carved scene with a ruler in a broad-brimmed hat, vanquished captive with a calendric sign above his or her head, and a worn hieroglyphic text placed between them. In its entirety Monument 2 bridges the site's Olmec heritage with Late Classic Veracruz conventions of image and text, forming a microcosm of Cerro de las Mesas elite traditions. While the enormous head on the obverse of the monolith is reminiscent of Tres Zapotes monumental sculpture in both form and detail (such as the three tear-like striations beneath the eyes), other elements, including the trefoil headdress and buccal mask anchor it firmly to Early Classic ruler portraits on Cerro de las Mesas stelae, a point noted by Mathew Stirling. Moreover, the dissociated head and fleshless jaw are consonant with the decapitated ruler with detached mandible interred in Cerro de las Mesas Burial II-18 amid lavish grave goods, including a plain stone yoke. Rulers on Cerro de las Mesas stelae are frequently dressed as ballplayers. Similarities between Burial II-18 and Monument 2 offer renewed credence to the notion that colossal heads represent rulers as ballplayers.

Wynne-Jones, Stephanie (University of York)
[250]
Discussant

Wynne-Jones, Stephanie [216] see Fitton, Tom

Xia, Yin [42] see Li, Xiuzhen

Xiao, Yuqi (Chinese University of Hong Kong)
[94]

Stories under the Patina: A Case Study of Bronze Production and Circulation in Southern Hunan

The inconsistency of the early development of bronze production throughout ancient China has been a gradually appreciated fact—especially for the southern mountainous area, where the distinctive topography has sorted and segregated the whole “south China” into various small regions. This study conducts compositional (SEM-EDS and p-XRF) and metallographic analyses of the major bronze collection in Chenzhou Museum, Hunan Province, which covered most findings within southern Hunan from Eastern Zhou to Eastern Han periods. This region is often known as a “cushion” area between the northern centralized polities and the less “tamed” ethnic groups in far south during multiple periods throughout history, yet received little research focus that clearly illustrates the manufacturing technology, provenance or symbolic value of its bronze findings and their implications on inner social configurations as well as inter-regional interactions. And a further systematic examination of the correlation among major element concentrations and artifact types in a diachronic frame combines the traditional typological and burial analyses. The preliminary results help us to better perceive the spread of esoteric knowledge, the mobility of symbolic objects and the role of crafts and materials in fortifying intangible boundaries in the frontier.

Xiuhtecutili, Nezahualcoyotl (Tulane University)
[118]
Moderator

Yaeger, Jason (University of Texas, San Antonio), Bernadette Cap (University of Texas, San Antonio) and M. Kathryn Brown (University of Texas, San Antonio)
[185]

A Maya Pyrite Mosaic Mirror from a Royal Tomb at Buenavista del Cayo, Belize

Maya rulers were often buried with pyrite mosaic mirrors. Mirrors were important components of a ritual divinatory-scrying complex in Classic Maya civilization. They were also prized objects, made by highly skilled artisans using rare and imported materials that appear on painted scenes of courtly life. This poster presents the excavation and conservation of a complex pyrite mosaic mirror recovered in a Classic-period royal tomb at Buenavista del Cayo, Belize. It describes how this composite object was crafted, assembling pyrite plaques, a slate mosaic core, and a complex mosaic and painted-stucco frame and back. The poster also describes the object's iconography and presents a broader interpretation of the object's significance for the Buenavista royal house and their political relationships to foreign powers, particularly Tikal.

Yaeger, Jason [178] see Friedel, Rebecca

Yakabowskas, Dana, Amanda Samuels (University at Albany) and Christopher Wolff (University at Albany)
[72]

Diversity in Hunter-Gatherer Research: A Bibliometric Analysis of Trends in Hunter-Gatherer Research within American Antiquity
 Hunter-gatherer/forager research in the field of archaeology has waxed and waned since *American Antiquity* published its first issues in the 1930s. We wanted to test our idea that hunter-gatherer research has been declining in North America and try to identify causal elements in shifts in hunter-gatherer research. Were they related to changes in social contexts, fluctuations in funding decisions, popular media trends, or strengths and weaknesses in academic institutions? We were also interested in changes in the demographic composition of hunter-gatherer researchers throughout the twentieth and twenty-first century. Using published papers from *American Antiquity* as a proxy, we compiled bibliometric data on several variables, including sex and academic institution of the first authors, journal editor, study topic, study area, culture studied, and date of publication. We used these data to conduct an, albeit limited, historical analysis of hunter-gatherer research and were able to identify clear trends in who conducts hunter-gatherer research and where (academically and regionally). We provide a few preliminary interpretations for these trends and suggest areas where we think this research can be used to address current gaps in the discipline and address larger concerns about diversity and the future of hunter-gatherer research.

Yamamoto, Atsushi, Juan Pablo Vargas and Oscar Arias
[257]

Investigations in the Valley of Cañar, Ecuador: Preliminary Results at Cerro Narrio and Loma de Pinshul

The Cañar Valley, located in the southern part of Ecuador, is one of the most important though unknown regions concerning the early cultural history in this country. Based on a short survey, we decided to carry out archaeological investigations at two important sites in this region, Cerro Narrio and Loma de Pinshul. These are located on top of natural hills in the Cañar drainage, and both sites are situated confronting in each other, possibly suggesting their unique relationships. In this session, we will present the preliminary results of our first field season and provide a new dataset focusing on the site chronologies through pilot studies of architectural and material styles. These new data allow us to compare the site history of both Cerro Narrio and Loma de Pinshul for the purpose of understanding the diachronic process between the two sites during the Formative Period (1500–500 BC). In addition, we will consider the implications of these new datasets from Ecuador in relation to the early frontier process between Peruvian North Highlands and Southern Ecuador.

Yamano, Hiroya [100] see Weisler, Marshall

Yann, Jessica
[267]

Resource Dependency Theory: A New Approach for Examining Trade Relationships

Eighteenth century trade and exchange in the Midwest has been characterized by give and take relationships (such as Richard White's middle ground) between Native American groups and Euro-American traders. Looking for new ways to think about the nature of these relationships, and borrowing from business and organizational studies, Resource Dependency Theory (RDT) has provided a better understanding of the power dynamics implicit in these economic exchanges. In this paper, several case studies are presented that show the efficacy of applying this framework, including both its capability for quantifying these relationships as well as providing more nuanced interpretations of the interactions occurring between these groups.

[267]
Chair

Yaworsky, Peter (University of Utah)
[15]

The Interactive Effects of Risk and Climatic Variation on Food Storage Behavior

Risk, or variation in outcomes, is an inherent part of the human condition and can result in the adoption of complex behavioral patterns that seemingly contradict expectations of human rationality. Thus, considering how risk constrains or encourages decisions is necessary to understand complex patterns of behavioral adaptation. However, to date, there are few broadly applicable formal models of risk from which researchers can derive testable hypotheses and predictions. To overcome this limitation, we use a formal model of risk developed by integrating components of behavioral ecology and utility theory. Using this formal model, we then derive predictions to explain the diverse food storage strategies undertaken by Formative Period (2100–500 BP) agriculturalists on the

West Tavaputs Plateau in central Utah, known as the Fremont. The Fremont employed an expensive strategy of storing agricultural products in constructed features high on the canyon walls, often placed in difficult and dangerous to access locations. Current explanations often rely on normative differences resulting from regional variation. Using the formal model, we derive predictions about how Formative Period agriculturalists should respond when facing risk and will test our predictions using temporal data, a paleoclimatic reconstruction, and high-precision locational data of storage features.

Yebra, Lucía [243] see Carline, Kristin

Yellowhorn, Eldon

[87]

Discussant

Yerka, Stephen (Eastern Band of Cherokee Indians, THPO)

[208]

Moderator

Yerkes, Richard [199] see Gyucha, Attila

Young, D. Craig [8] see Rice, Sarah

Young, D. Craig [195] see Vernon, Kenneth

Young, Danielle (University of Central Florida), Neil Duncan (University of Central Florida) and John Walker (University of Central Florida)

[4]

Diet and Agriculture in the Bolivian Amazon

Recent palynological research in the Llanos de Mojos (Mojos), a seasonally inundated tropical savanna in the Amazonian lowlands of Bolivia, has shown that Pre-Columbian peoples altered their environment by clearing forests to construct raised fields for agriculture since at least 310 CE. However, our understanding of what crops people in communities cultivated on raised fields, consumed, and processed is still tenuous. This paper presents the results of microremain analyses of ceramic residues from four forest island communities in Mojos that provide direct evidence of people-plant interrelationships. Additionally, starch grain evidence for maize, manioc, and other root crops in ceramic residues provides indirect evidence that these plants were grown on the raised fields. Finally, through comparing assemblages of ceramic residues from several forest island communities, the results inform the broader discourse on social identity in Mojos, as meals and cuisine have often been a venue for the creation and reaffirmation of shared identity between community members.

Young, Kenneth (University of Texas at Austin)

[226]

Discussant

Young, Michelle (Yale University)

[182]

"International" before Nations: Ceramics and Supra-regional Identity Formation within the Chavín Sphere of Interaction

The introduction of novel ceramic styles into multiple sites or areas can be attributed to a wide range of social processes, including intensive trade, emulation, migration, and/or conquest. During the Early Horizon (800–400 BC), the adoption of so-called "Chavinoid" ceramics across distant regions of the Peruvian Andes has been interpreted as a symptom of widespread influence of the Chavín religious cult. Expanding upon prior work, I use the results from a detailed study of Early Horizon ceramics from the region of Huancavelica to propose that "Chavinoid" ceramics can be fruitfully understood as an "international style." This term, which has already gained traction within archaeological and art historical discourses, refers to the fluidity of material and/or visual culture across sociocultural boundaries with symbolic and stylistic conventions determined through the interaction between several groups. Finally, I explore how "international" ceramic visual culture was used to construct and maintain supra-regional communities rooted in shared values and religious practices. This research offers a nuanced perspective on the recursive relationship between material culture and communal identity.

Young, Michelle [61] see Weber, Sadie

Younie, Angela [82] see Gillispie, Thomas

Yu, Chong (Sun Yat-sen University)

[45]

Fishing in Neolithic South China: The Case Study of Guye, Guangdong

Based on the fish remains from Guye site in Guangdong province, this research aims to establish the pattern of fish resource exploitation in the Pearl River Delta area dating from 6,000 to 5,000 years ago. Both qualitative and quantitative analysis were applied on fish remains in the studied region. It will be one of the very few such studies in the whole country. The result of this study reveals at least 17 species of fish were exploited by the inhabitants. The details of past environment and ancient subsistence of Pearl River Delta during middle Neolithic were discussed by reconstructing the body length of several key species.

Yu, Pei-Lin (Boise State University)

[199]

Neolithic Gardening: Spatial Frames of Reference for the Quiet Revolution

Gardening was, and is, revolutionary. The unique resiliency of gardens stems from diverse cultivars, small scale, beneficial wild and commensal species, positioning near dwellings, and a household unit of production with much of the labor contributed by women, children, and the elderly using hand-cultivation techniques, embedded with other tasks. These properties distinguish gardening as an evolutionary strategy distinctive from foraging and farming, and sometimes essential to their success. I argue that in Neolithic transitions gardening will take root before farming in the sub-tropics, endure alongside farming, offer a backstop when the fields fail, and play an important role during oceanic and other diasporas. However, the properties that make gardening resilient also make them challenging to perceive in the archaeological record. This paper uses the strength of ethnoarchaeological approach to describe spatial context and configuration of sub-tropical gardens using original ethnoarchaeological data from eastern Taiwan, and discuss implications for Neolithic gardening in an evolutionary perspective.

Yue, Hongbin [205] see Ledin, Lauren

Yue, Zhanwei [94] see Liu, Yu

Zaneri, Taylor (University of Amsterdam)

[143]

Enacting Health in the Medieval City: A Geospatial Analysis of Waste and Water in Bologna

What was a healthy and clean city in medieval Europe and how was this achieved? How did medieval cities handle critical public health issues such as the disposal of domestic and industrial waste, and the preservation of clean water? This paper examines how refuse management was handled by households, workshops, and neighborhoods from AD 1200 to 1500 in the city of Bologna. Using archaeological data from twelve published excavations from across Bologna, along with historical population data in GIS, this paper examines how waste management spatially varied across the medieval city. How were different types of refuse (household, industrial, sewage, and animal) managed? This information is correlated with the medieval canal system in Bologna, which was used for both industrial production and waste removal purposes. Were their areas or zones within the city that bore a greater burden of material waste or polluted water? How were cleanliness and "public health" differentially experienced in the medieval city? In sum, this paper investigates the connections medieval people made between human behaviors and urban health, how health was enacted through the management of waste and access to clean water, and how this differed spatially among the citizens of Bologna.

[143]

Chair

Zaneri, Taylor [22] see Crabtree, Pam

Zant, Caitlin [192] see Galloway, Tori

Zapata, Josefina [162] see Cabanes, Dan

Zaragosa, Gabriella, Robert Hard (University of Texas, San Antonio), John Roney (Colinas Cultural Resource Consulting), Arthur MacWilliams (Independent Scholar) and Mary Whisenhunt (University of Texas, San Antonio)

[156]

The Plaza at the Sanchez Site: Communal Architecture at an Early Cerro de Trincheras in the Safford Basin

The Sanchez Site (AZ:CC:2:452 [ASM]) is a massive cerro de trincheras constructed on a steep, 200 m high hill overlooking the upper Gila River east of Safford, Arizona. Radiocarbon dating and widely distributed brownware sherds place the site in the Early Agricultural and Early Pithouse periods. The site contains at least 143 rock ring structures and 1.5 km of walls and terraces as well as a constructed communal space. The plaza was constructed by clearing a 27 × 31 m area and bounding it by a low perimeter wall. This feature lies athwart a ridgetop saddle 30 m north of the primary concentration of rock ring foundations. Systematic collections from the plaza surface produced brownware sherds, two Mimbres Black-on-white sherds, and chipped stone. Test excavations within the plaza in 2018 documented a potential thermal feature and stratigraphic profiles. A radiocarbon date from the feature yielded a date of cal AD 1018–1155. The significance of the Sanchez plaza, including its construction, use, and apparent Classic period reuse, are considered.

Zaro, Gregory (University of Maine), Martina Celhar (University of Zadar), Igor Borzic (University of Zadar) and Dario Vujevic (University of Zadar)

[85]

Town Planning through the Ages: Millennial-scale Continuity and Discontinuity at the Nadin-Gradina Archaeological Site in Northern Dalmatia, Croatia

The Ravni Kotari region of northern Dalmatia is home to a number of archaeological sites that reflect a long record of urbanization. At Nadin-Gradina, a hillfort settlement centrally positioned in Ravni Kotari, collaborative work over the past five years has begun to reveal components of an Iron Age Liburnian occupation beginning as early as the eighth century BCE or so, its evolution into a Roman municipium in the late first century BCE or early first century CE, and its apparent abandonment in the sixth century. Its reemergence in the Late Middle Ages and Early Modern Era is also evident and caps this millennial-scale process of change. The long-term record at Nadin provides an opportunity to evaluate principles of urban planning through time, and its evolution within the context of broader cultural changes evident in the archaeological record. In this paper, we rely primarily upon remnants of streets, edifices, town walls, and other elements of urban infrastructure to evaluate millennial-scale continuity and discontinuity evident in its urban plan.

[85]

Chair

Zarzycka, Sandra (University of North Texas)

[149]

Geospatial Relationships between Ancestral Puebloan Community Centers and Landscape

Past research on Ancestral Puebloan settlement patterns indicates a relationship between the location of community centers and their surrounding landscape throughout time. Beginning in the Pueblo I period, settlement in the central Mesa Verde Region was characterized by aggregation into large community centers. By the late Pueblo II, settlements shifted from large settlements on mesas surrounded by dispersed, associated hamlets to very large community centers located along canyon heads. The location of the later centers is thought to be related to sociopolitical shifts or environmental stress. Whatever the reason for this change in settlement location, resource access changed. This study aims to evaluate whether the change in community center location impacted the quality of the landscape immediately available to inhabitants. Specifically, variables related to farming and hydrologic potential, including soil type, soil moisture, elevation, land cover type, geomorphologic description, distance to water sources, and geologic units are evaluated. Seven community centers within the McElmo drainage area in southwestern Colorado from the Pueblo I to Pueblo III periods are included in this study. Because community centers often contain satellite communities within 2 km of the city center, a 2 km buffer will be used to define each site's area.

Zavala Moynahan, Bridget (Universidad Juarez del Estado de Durango)

[121]

The View from Above: Landscape and Dwelling in the Sextin Valley, Durango, Mexico

Over the past 10 years, the Proyecto Arqueológico Sextín, has recorded a series of sites in northern Durango, Mexico. Here, our team, has recorded considerable variability in the artifacts, settings and individual site configurations in the valley. In this poster, I show how the inhabitants of the prehispanic sites of the Sextin, chose land forms, built spaces, and incorporated materials in order to create significant places for their everyday lives. My landscape analysis takes in the account the embodied nature of place making in the archaeological past that serves to highlight special aspects of "dwelling" in this northern Mexican land revealed by surface data from our 2008 pedestrian survey in the Sextin valley and excavation results from two of the largest sites: Corral de Piedra (PAS017) and Los Berros (PAS023).

[121]

Chair

Zavodny, Emily (University of Florida), Dalibor Šušnjic (Ministry of Culture, Croatia), Tatjana Kolak (Muzej Like Gospic) and John Krigbaum (University of Florida)

[35]

Risk and Reward in the Late Bronze Age: Preliminary Faunal and Isotopic Results from Excavations at the Piplica Hillfort in Lika, Croatia

Risk-adverse behaviors have long interested archaeologists and anthropologists, but understanding how humans navigated difficult environments in the past can also inform present day conversations about resilience and sustainability. Today the Lika region of central Croatia is considered an unpredictable and resource-poor environment. Though this characterization is assumed to have held true in prehistoric times as well, the Late Bronze Age (1200–800 BC) is characterized by the seemingly rapid emergence of economic and sociopolitical complexity throughout the area. Results from summer 2019 excavations at one Late Bronze Age hillfort site in this region, Piplica, provide an opportunity to identify and characterize site-specific economic activities. Here we integrate faunal analysis with light isotope ratios derived from bone and teeth (carbon, oxygen, nitrogen) to help understand changing animal management strategies as a proxy for economic specialization and centralization. We also present a preliminary site chronology with new AMS radiocarbon dates in order to reconstruct the timing and tempo of these processes at Piplica and contextualize these changes in broader regional context

Zborover, Danny (Institute for Field Research), Alex Badillo (Indiana State University) and Willy Huashuayo Chávez (Museo Escolar Lumbreras Salcedo, Iquipi)

[268]

The Petroglyphs of Chillihuay: Context and Meaning

Located only a few miles from Corral Redondo, the adjacent sites of Chillihuay 1 and Chillihuay 2 jointly consist among the largest and most impressive concentration of petroglyphs in southern Peru. Etched, carved, and pecked on geologically distinct rock

outcrops and boulders high above the Chorunga Valley, these geometrical, anthropomorphic, and zoomorphic designs were purposely distributed along narrow trails and hard-to-reach canyons throughout several centuries. Although Chillihuay was known to archaeologists since at least the 1990s, little systematic work has been conducted on the function and meaning of this enigmatic site. The Corral Redondo archaeological project is the first to study the site in its broader chronological and cultural context, by using field methods ranging from pedestrian survey, photographic documentation, and drone photogrammetry. In this presentation we discuss the spatial patterns, iconography, and possible meaning(s) of Chillihuay. We further comment on the site's alarming state of preservation, brought by natural and human-made factors.

[268]

Chair

Zborover, Danny [268] see Lozada, Maria

Zeanah, David [15] see Coddington, Brian

Zeanah, David [195] see Vernon, Kenneth

Zedaker, Dylan (University of Cincinnati), Kenneth Tankersley (University of Cincinnati), Louis Herzner (University of Cincinnati) and Harrison Stanley (University of Cincinnati)

[63]

Evidence of a Cosmic Airburst Event at the Miami Fort Village Site

The Miami Fort Village site (33Ha62A) is a stratified multi-component habitation located within the eastern margin of the Miami Enclosure (33Ha4), a Middle Woodland hilltop earthwork complex. The site is situated along the extreme margins of a high Illinoian terrace overlooking the confluence of the Great Miami and Ohio River. Geologically, the terrace is composed of a complex suite of outwash and lacustrine deposits, underlain by upper Ordovician fossiliferous limestone and shale. The site was recently excavated as part of the 2019 University of Cincinnati, Department of Anthropology Archaeological Field School, which exposed the remains of a large burned structure, Hopewell pottery and flaked-stone artifacts. Positive platinum (Pt) and iridium (Ir) anomalies and a plethora of micro-meteorites and micro-tektites were found on the burned surface of the dwelling. Some of the micro-tektites were fused to fine-grained sandstone. A suite of radiocarbon dates and typologically distinctive artifacts suggest a cosmic airburst event occurred during the Middle Woodland cultural period.

Zedaker, Dylan [63] see Herzner, Louis

Zedeño, María Nieves (University of Arizona), François Lanoë and Danielle Soza

[23]

Reimagining the Plains Archaic

A few decades ago, Plains archaeologists debated whether to retain or reject the term "Archaic" in their typologies. At issue was the dearth of evidence of broad-spectrum adaptations and decreased mobility seen in other regions. Yet, what evidence was available was unevenly distributed from south to north. Today, two archaic typologies exist: one which retains the original term (e.g., Frison et al. 2010) and one which uses the nondescript "Middle" term (e.g., Peck 2011). We argue that Plains societies, including mobile hunters of the northwestern Plains, should rightfully be termed "Archaic" given their socioreligious developments, horizontal monumentality in particular, that parallel those of mound-building societies to the east. In turn, such developments point to ethnogenetic processes that eventually gave rise to societies such as the Blackfoot as early as 5,000 years ago.

Zeidler, James (Colorado State University)

[157]

New Perspectives on Holocene Ecuadorian Volcanism and Its Impacts on a Distal Prehispanic Landscape in Late Jama-Coaque II Times

Long-term archaeological field research in the Jama Valley of coastal Ecuador has documented the presence of three tephra layers representing large-scale volcanic eruptions (VEI=4–5) emanating from the northern highlands, all of which had dramatic impacts on several prehispanic cultures resulting in valley abandonment and depopulation for several centuries in each case. These were cultural occupations of Terminal Valdivia, Chorrera, and Jama-Coaque I peoples extending from ca. 2000 BCE to 90 CE. More recent tephrochronological investigation has documented the presence of at least four additional Holocene volcanic events in this distal landscape some 200 km west of the source eruptions but without archaeological associations. While the latter events apparently had lighter cultural impacts, they still merit detailed archaeological attention as case studies in volcanic hazards, cultural effects, and differential response, recovery, and resilience. Special emphasis is placed on the 800 BP eruption of Quilotoa volcano (VEI=6), not generally observable in the archaeological stratigraphy but possibly correlated to a major phase break in the archaeological sequence (between Muchique Phases 3 and 4) and a locational shift in sociopolitical power and chiefly dominance from the middle valley site of San Isidro to the lower valley mound center of Santa Rosa.

Zeidler, James [24] see Buck, Caitlin

Zejdlik, Katie [169] see Bews, Elizabeth

Zender, Marc (Tulane University)**[223]***The Snake Dynasty: What We Know and What We Don't*

Epigraphic discoveries of the last few years now make possible a fresh engagement with questions about the origins and development of the Snake dynasty, of its external political influences during both the Early and Late Classic periods, and of the multiple physical centers from which the dynasty held sway. On present evidence, the Snake dynasty seems to have emerged at or near Dzibanché in the late first or early second century AD, and during the next 600 years it would experience a dramatic series of successes and reversals including a dramatic sixth-century expansion, a disastrous seventh-century civil war, and a relocation of its capital to Calakmul during the long reign of Yuhknoom Ch'een (AD 635–685) and two successors. Perhaps of equal importance with its political influence were the unique cultural elements either introduced or disseminated by the Snake dynasty during its ascendancy: market economies, public sports, increased prominence of women in public art, and increased visibility of non-royal nobility. Several of these features seem to have survived the early ninth century collapse, influencing later Maya civilization of the northern lowlands and southern highlands.

Zhai, Shaodong (Institute of Archaeology, Chinese Academy of Social Sciences), Guitao Tang (Xiamen University), Wei Ge (Xiamen University), Wanfa Gu (Zhengzhou Institute of Cultural Relics and Archaeo) and Qian Wu (Zhengzhou Institute of Cultural Relics and Archaeo)
[45]*Economic Practices Reflected from the Unearthed Lithic Objects at the Huadizui Site, Central China*

There were 163 pieces of lithic objects unearthed from Huadizui, which could be dated back to ca. 1850–1750 BC in Central China. A series of analyses were conducted including raw material investigation, replication experiments, use-wear study and residue analysis. The results showed that no raw material was available for Huadizui to make lithic objects within an area with a radius of 10km and the production of lithic objects at Huadizui might only meet the demand of itself. The research on the residue of the knives showed that Huadizui cultivated *Triticum aestivum*, *Setaria italica*, *Panicum miliaceum*, *Vigna unguiculata*, and might forage *Coix lacryma-jobi*, *Sorghum bicolor*, *Quercus*, *Dioscorea opposita*. The arrowheads found at the site might be used for hunting rather than fighting. Some axes and adzes reflected the existing frequent wood-working activities. The cinnabar found on a stone pestle indicated the activity of grinding cinnabar ever existed at the site. The grooved ground stones showed that the bone-making activities existed. The unearthed lithic objects from the Huadizui site showed a complex economic practices model existed at the site, including developed agriculture, hunting and gathering activities, wood-working, bone-making, grinding cinnabar activities and so on.

Zhang, Peiqi (University of California, Davis), Meredith Carlson (University of California, Davis), Caleb Chen (University of California, Davis), Christopher Beckham (University of California, Davis) and Tammy Buonasera (University of California, Davis)
[83]*The Steep Costs of Manufacturing Long Pestles in Late Period Central California: Results from Replicative Experiments*

The appearance mortars and pestles are associated with the acorn-based resource intensification in central California, which is also linked with decreased mobility and changes in social organization. Many long (> 35 cm) and completely shaped pestles are associated with Late Period California (AD 1265- 1770 cal) contexts, particularly burials, and also appear in a number of ethnohistoric photos of women pounding acorn. Given the central role these tools played in daily life, and the personal connection they seem to have had with individuals, we sought to learn more about their manufacturing costs and sequence of manufacture. Our initial attempts to manufacture pestles met with a very high failure rate (75%); suitable raw materials were also difficult to find. Here we present the results of a subsequent series of manufacturing experiments designed to understand how much various factors, such as raw material selection and operator skill, may significantly impact manufacturing success. We also explore the sequence of pestle manufacture with respect to specific debris that may be left behind in the archaeological record.

Zhang, Peiqi [83] see Carlson, Meredith

Zhang, Ren [19] see Esker, Donald

Zhang, Tingliang [111] see Zhang, Yasha

Zhang, Wenjie**[45]***The Music of the Zeng State based on New Archaeological Findings*

Based on the new archaeological findings in the cemeteries of Zeng (including the Yejiashan, Guojiamiao, Wenfengta, Zaoshulin, Leigudun etc.), we can get a better understanding of the development of the music system of Zeng state. This research will mainly focus on exploring how this system changed from the Zhou-style music to the Zeng-style music, mainly by looking at the use of Chime bells among different nobles of Zeng at different time period. Accordingly finally we hope to give a new explanation of how the chime bells of Zenghou Yi were created and why they were suspended at such a special form.

Zhang, Yasha (Rock Art Research Association of China [RARAC] in Minzu University of China) and Tingliang Zhang (Cultural relics management centre of Jiangjin, Chon)
[111]*Discovery and Research of Chinese Paleolithic Rock Art*

In the mid-1970s, cave handprints were found in Inner Mongolia, China. Some archaeologists thought it was related to the late paleolithic age. Later, a little analogous sites were also found in Xinjiang and Qinghai, but these had little impact. After the twenty-first century, several large animal sites were found in southwest China. Among them, The Jinshajiang river rock art in Yunnan were dated from 4000 to 14,000 years ago, and it is basically confirmed that some of the images belong to the late paleolithic. Some researchers thought it resembles magdalenian art in Europe. Recently, we have found the Huiqianyan site in Chongqing, whose animal style is obviously older than the age of those in Jinshajiang River. It is difficult to use carbon-14 or uranium method for dating due to that these figures were chiseled on the cliffs. From the perspective of theme and style, we believe that this rock painting should be a rock art site whose image and style are closest to the late paleolithic age in China. The animal patterns here are mainly buffalo and wild horses, and there were thousands of large and small patterns overlapped tier upon tier on nearly 80 m² of cliff.

Zhao, Chao, Qingchuan Bao (Inner Mongolia Institution of Archaeology and Cult) and Xiaonong Hu (Ulanqab Museum)
[199]

The Early Neolithic Human Adaptation to the Steppe Environment: Implications of the New Discoveries in Ulanqab Region at the Southeastern Edge of Eurasian Steppe

How human beings organized themselves to make a living on the steppe before the adoption of pastoralism has largely gone unexplored. Recent excavation of two residential sites, as well as discoveries of numerous other sites during survey in Huade county, Ulanqab, Inner Mongolia, China provide rich information about the land-use strategy employed by prehistoric communities during the Holocene climate optimum. A synthetic analysis of material remains, structures, site distributions, and intersite variability indicate that people took advantage of climatic amelioration to make intensive use of the surrounding environment by decreasing mobility. They lived a semi-sedentary lifestyle, with seasonal shifts of more permanent residential sites accompanied by the temporary use of certain locations for specific subsistence activities. This subsistence-settlement pattern was based on the broad exploitation of wild plant and animal resources, and, to a much lesser extent, millet cultivation as an auxiliary food resource.

Zhao, Jian-xin [100] see Weisler, Marshall

Zhao, Yu-chao (University of Michigan Museum of Anthropological Archaeology), Justin Elliot Jones (Department of Sociology and Anthropology) and Thomas Schloeman (Department of Sociology and Anthropology)
[37]

Global Comparison of High-Quality Stone Tools in Historic Time Periods: Examples from Texas and Tibet

Stone tools span 3.3 million years of human history. Lithic artifacts are the most conspicuous and sometimes the only trace of ancient lifeways in Paleolithic sites. However, stone tool use continues as a tradition and common practice among hunter-gatherers, pastoralists, and agriculturalists. Why did this technology continue long after the introduction of metal tools and other technologies? To address these questions, we present comparative analyses of cases from the historic period where stone tools have been excavated by archaeologists or studied ethnographically. Examples from Way Ranch, Texas, as well as a cave site in Tibet that is 4,600 m above sea level excavated by Yuchao Zhao will be presented. We will compare these archaeological materials to studies from Australia, Europe, and Africa. This poster presents our preliminary results, which demonstrate the persistence and diversity of lithic technologies during historic periods across the globe in different economies; and provides broader implications concerning functionality, familiarity, identity, and gender.

Zhao, Zhijun [35] see Sun, Yufeng

Zhu, Sihong (Emperor Qin Shihuang's Mausoleum Site Museum, Xi'an, China)
[42]

Study on Adhesive Material Used for Restoration of the Qin Terracotta Warriors

In the 1980s, epoxy resin was used as an adhesive for the restoration of more than 1,000 terracotta figures in pit no. 1. According to the material characteristics, this kind of adhesive will age and lose effectiveness after about 50 years. It has been 40 years since the restoration of the terracotta figures, and it is urgent to assess the safety status of the restored terracotta figures and take measures to protect them. According to the principle of conservation of cultural relics, if an appropriate isolation layer is added to the bonding surface of ceramic tiles, the reversible bonding process can be achieved. The strength of the adhesive should be slightly lower than that of the clay figures themselves. High-strength binder will form a big gap with the strength of cultural relics (terracotta figures), resulting in a serious mismatch between the two and potential to cause secondary damage to cultural relics. Therefore, it is urgent and necessary to systematically study and select bonding repair materials and their implementation techniques.

Zilhão, João [162] see Cabanes, Dan

Zimmer-Dauphinee, James (Vanderbilt University), Gabriela Ore (Vanderbilt University) and Steven Wernke (Vanderbilt University)
[175]

Archaeology at Scale: Toward Automated Imagery Survey in the Andes Using Convolutional Neural Networks

In recent years it has become common practice to use satellite imagery for archaeological prospection. However, nearly all of this work has been done using brute force manual methods, and often unsystematically. As a result, areal coverage is often both limited and biased in unspecified ways. Such data are of limited utility for addressing regional scale anthropological problems. Machine learning poses potential solutions to these problems by enabling systematic survey of much larger areas than is otherwise practical,

and development of measures of expected bias in the resulting data. This research implements a Convolutional Neural Network (CNN) to autonomously detect relict architectural features visible in high resolution satellite imagery of over 1,000 km² in the Southern Peruvian highlands. It also examines known biases in the results and discusses the utility of the resulting database to address questions settlement patterns, economic, and social networks on a truly regional scale. We discuss the importance and structure of training data, as well as overall system design. Results of the CNN-based survey are promising for its adaptation to even larger areas.

Zipkin, Andrew [38] see Murray, John

Zoeller, Gretchen (Indiana University-Purdue University, Indianapolis)

[167]

Diseases and the Darker Histories of Bethel Cemetery: A Case Study of Treponemal Disease

The Bethel Cemetery was excavated in the summer of 2018, as part of a basin development project at the Indianapolis International Airport, yielding 543 individuals who were interred between 1827 and 1935. Close to 80% of these individuals originated from unmarked graves, rendering personal identification and corroboration with headstones and other cemetery records problematic at best. As a result, bioarchaeological analyses became one of the primary means to learn and develop histories about life in rural central Indiana during the nineteenth century. The case study presented here examines Burial 505, an unidentified young adult female with pathological markers indicative of treponemal (syphilitic) infection. Interesting for both the biological and social implications, this analysis combines biological, spatial, and historical clues to identify Burial 505 and unearth her story. This examination simultaneously illustrates how, what originated as a paleopathological case study, provided an unanticipated window into the experiences of these early Indiana settlers and argues for the relevance and necessity of an interdisciplinary archaeology to inform our research directions and interpretations of the past.

Zori, Colleen (Baylor University)

[51]

Life and Death in Medieval San Giuliano (Lazio, Italy)

The medieval period in northern Lazio saw significant restructuring of social and economic relationships through incastellamento, the process by which people chose or were forced to move onto fortified hilltops. I here present results from four seasons of mapping, drone photogrammetry, excavations and analysis of a castle complex located atop the San Giuliano plateau. New radiocarbon dates, combined with artifact and architectural analysis, establish the sequence of occupation of a hall and a semi-subterranean mortuary structure thought to have been attached to an as-yet unexcavated chapel. Economic activities, including trade and feasting, were carried out by the living and indicate a growing degree of wealth and prestige of those using the hall. Meanwhile, the dead were interred in slot graves and in architectural support trenches in a narrow rectangular structure at the eastern end of probable chapel. Preliminary analyses of mortuary behavior and the demographics of the medieval burial population are compared to other sites in medieval Italy, demonstrating that although interments followed broadly Christian patterning across the region, there was considerable diversity in the details of practice at each site.

[51]

Chair

Zori, Colleen [51] see Grimes, Vaughan

Zori, Colleen [51] see Jones, Lauren

Zori, Davide (Baylor University)

[51]

The San Giuliano Archaeological Research Project: New Interdisciplinary Archaeology in Central Italy

This paper introduces the San Giuliano Archaeological Research Project, the focus of this symposium. Our on-going surveys and excavations at the multicomponent site of San Giuliano (Lazio, Italy) have uncovered a dynamic landscape of interlocking settlement and burial that span the advent of Etruscan civilization to the zenith of the High Middle Ages. We have documented over 500 previously unmapped Etruscan tombs, conducted salvage excavations of four previously-looted chamber tombs, and discovered four transitional Villanovan-Etruscan trench tombs dating to around AD 700. Excavations on the plateau have revealed a medieval castle complex, including a feasting hall, a defensive tower, and a crypt with dozens of burials associated with a private chapel. An urban center developed atop the San Giuliano plateau in the seventh century BC, and flourished in the sixth and fifth centuries. After Roman Conquest in the third century, people chose to leave the site in favor of dispersed lowland habitation. In the Middle Ages—sometime between AD 800 and 1200—the local population reoccupied and refortified the earlier Etruscan acropolis. Our project seeks to understand the nature and motivations of these settlement shifts.

Zori, Davide [51] see Jones, Lauren

Zralka, Jaroslaw (Institute of Archaeology, Jagiellonian University), Bernard Hermes (Nakum Archaeological Project), Carmen Ting (Nakum Archaeological Project), Ronald Bishop (Smithsonian Institution) and Wieslaw Koszkuł (Nakum Archaeological Project)

[128]

Dynamics of Growth of Nakum during the Protoclassic: Ceramic Evidence

Recent research at the Maya site of Nakum, located in northeastern Guatemala, has revealed evidence of intensive Protoclassic (ca. 100 BC–AD 300) occupation. Architectural constructions, burials, and offerings documented at Nakum indicate that this center

experienced major growth and important transformations during the turbulent transition between the Preclassic and Classic periods. In this paper, we present the dynamics of growth of Nakum during this timeframe by focusing mainly on ceramics. Stylistic, petrographic and physio-chemical analyses of Protoclassic ceramics from Nakum show that some older, local ceramic traditions persisted at the same time that new elements more characteristic of Protoclassic ceramics at other Maya sites appeared. We use compositional and stylistic analysis of ceramics as well as results of studies of other artifacts made from raw materials in an attempt to trace trade and economic networks across the Maya lowlands.

Zuckerman, Molly [131] see Turner, Bethany

Zúñiga, Belem [10] see Velazquez, Adrian

Zwyns, Nicolas [175] see Gillam, J. Christopher

Zych, Thomas (University of Toledo)

[78]

Comparing Approaches to Geometric Morphometric Analyses: A Ground Stone Discoidal Case Study

The burgeoning popularity of innovative methods like 3D morphometric analysis allows archaeologists to address specific questions pertaining to artifact shape and form that contribute to explorations of human cultural identity, technological developments, and expressions of style. This poster explores the utility of these methods as they pertain to prehistoric gaming pieces from the North American midcontinent known as Chunkey stones or discoidals. These ground stone objects were made popular starting in the tenth century, simultaneous with the coalescence and spread of Mississippian practices and materials in the Midwest, though game pieces are found at sites well beyond the range of direct cultural contact between Mississippian and non-Mississippian peoples. A geometric morphometric analytical approach is employed to explore variation in the shape of game pieces beyond the typological categories they are often attributed, e.g., Cahokian, Bradley, or Jersey styles. This analysis compares results from hand-drawn, 2D profiles of game pieces and profiles derived from 3D laser scanning to explore (1) the utility of geometric morphometrics in the analysis of spherical-to-discoidal ground stone objects; and (2) if the 3D laser-scanned dataset provides notable benefit to the analytical process of this class of objects when considering expenditure resources in the analytical pursuit.