

## INDIVIDUAL ABSTRACTS OF THE SAA 83RD ANNUAL MEETING

house and platform construction, access to luxury items, and cranial and dental modifications. Although non-elites include some urban residents and all hinterland residents, this study proposes that some hinterland residents also identified as elites. The Medicinal Trail Community is a hinterland settlement with considerable variation in household complexity, ranging from simple perishable structures informally arranged, to households on elevated platforms formally arranged around a courtyard. The latter residents attempted to adopt the social identity of the urban elites by using the symbols and material culture of the "Urban Elites," therefore becoming "Hinterland Elites." As a result, these "Hinterland Elites" economic and socio-political status was elevated above most of the community's inhabitants, providing them with limited social power. Although their elite identity was probably not acknowledged by the urban centers, by distinguishing themselves from those in their immediate community, they used this identity to gain and maintain power within the community.

Hyde, David [243] see Sullivan, Lauren

**Iannone, Gyles (Trent University), Pyiet Phyo Kyaw (University of Yangon), Nyien Chan Soe (Yadanabon University), Saw Tun Lynn (University of Yangon) and Scott Macrae (Trent University)**

**[56]** *Water, Ritual, and Prosperity at the Medieval Capital of Bagan, Myanmar (11th to 14th Centuries CE): Preliminary Exploration of the Tuyin-Thetso "Water Mountain" and the Nat Yekan Sacred Water Tank*

The IRAW@Bagan project is aimed at developing an integrated socio-ecological history for residential patterning, agricultural practices, and water management at the Medieval Burmese (Bama) capital of Bagan, Myanmar (11th to 14th century CE). As part of this long-term research program investigations have been initiated on the Tuyin-Thetso mountain range, located 11.25 km southeast of Bagan's walled and moated epicenter. This upland area figures prominently in the chronicles of early Bagan, and numerous 13th century religious monuments were erected there. Recent explorations on Tuyin-Thetso have drawn attention to an additional feature of historical significance, a rock-cut tank located along the eastern edge of the Thetso-Taung ridge. Referred to by local villagers as Nat Yekan (Spirit Lake), this reservoir appears to have been integral not only to the initial collection and subsequent redistribution of water via a series of interconnected canals and reservoirs spread across the Bagan plain, but also, through its associated iconographic imagery, it may have been intended to purify this water, symbolically enhancing its fertility. This presentation will provide a preliminary assessment of Nat Yekan's potential economic, political, religious, and ideological significance during Bagan's classical era.

Iannone, Gyles [142] see Demarte, Pete

**Ibarra, Eugenia (Universidad de Costa Rica)**

**[260]** *What Archaeologists Can't See: Contrasting Ethnohistorical and Archaeological Data in Talamanca, Costa Rica in the 16th Century*  
Archaeologist Francisco Corrales and myself recently undertook the study of the exploitation of natural resources and their exchange in the areas close to Juan Vázquez de Coronado's route in 1564, traced from the Pacific coast to the Caribbean in Southeastern and Southwestern Costa Rica. This presentation aims to underline how resources of the different altitudes on both slopes formed an important part of the various activities carried out by the inhabitants during the 16th. century and immediately before. I will detail the paraphernalia used by usékares and sukias as it becomes important to understand the nature, presence and movement of distinct objects. I will also discuss how, on the area, ethnohistorical, ethnographical, linguistic and mythological data are able to depict clues to the presence or absence of material culture. The Museo Nacional de Costa Rica holds materials coming from that precise area, with no context. A sharper look at written sources can help reconstruct the sociocultural dynamics which can aid archaeologists to interpret and orient their specific work objectives.

**Ibarra, Julio (INAH OAXACA)**

**[158]** *Trabajos de Conservación Arquitectónica en el Sitio Arqueológico de San Pedro Nexicho, Colaboración INAH-FAHHO-Comunidad*  
La conservación del patrimonio arqueológico en la región de la Sierra Norte del estado de Oaxaca, representa un gran reto debido entre otros aspectos a su entorno geográfico, a cuestiones del ámbito social que se relacionan con el arraigo a sus costumbres y tradiciones; y más aún, a la falta total de antecedentes sobre trabajos previos de conservación sobre el patrimonio cultural local.  
En esta ponencia se presentarán los trabajos de intervención para la conservación y restauración de los vestigios arqueológicos efectuados durante el desarrollo del proyecto de intervención en el Sitio Arqueológico San Pedro Nexicho, avalado por el INAH y con fondos de la Fundación Alfredo Harp Helú de Oaxaca, han dado como resultado primeramente frenar el proceso de deterioro al cual fueron sometidos a partir su localización, saqueo y desatención; logrando mediante la aplicación de los criterios de restauración, sentar las bases para garantizar su conservación, partiendo de la concientización de la comunidad a raíz de su participación en dicho trabajos.

**Ibarra, Thania (Proyecto Arqueológico Tepeticpac—Centro INAH Tlaxcala) and Aurelio López Corral (Instituto Nacional de Antropología e Historia)**

**[31]** *A Technological Approach of Textile Production in Late Postclassic Tlaxcallan*  
Textile production had a pivotal role among Late Postclassic societies including ancient Tlaxcallan, a prominent altepetl of the Puebla-Tlaxcala region. Several scholars have studied prehispanic cloth and garments production based on 16th century historical sources, but using little archaeological evidence. In particular, poor attention has been paid on the technology of textile production based on archaeological artifacts, especially in relation to spinning techniques and the different fibers exploited. In order to assess the technological characteristics of thread production in Tlaxcallan, here we analyze a sample of 364 archaeological spindle whorls recovered at the site of Tepeticpac, one of the main members of this political entity. By evaluating their mechanical performance, in association to different fiber processing techniques and thread qualities, we establish the existence of two large groups of archaeological whorls that are correlated with two spinning techniques. In addition, experimental analysis using replicas shows that it is possible to process a variety of short or long staple fibers with each spinning technique, and that artisans can choose the type of spindle whorl to use according to personal experience and skills.

Iceland, Harry [59] see Hirth, Kenneth

**Ichikawa, Akira**

**[18]** *Intraregional Interaction in the Zapotitan Valley, El Salvador: The San Andres Regional Center and Joya de Ceren Village*  
This paper provides new insights to better understand the intraregional interaction, especially San Andres and Joya de Ceren in the Zapotitan Valley of El Salvador. Joya de Ceren is a village of commoners that was buried by the Loma Caldera eruption, which occurred around AD 650; it is one of the most studied ancient villages in Mesoamerica. Moreover, the previous study indicate that this village might have been closely connected to San Andres, which is the religious, political, and economic center in the region. However, due to limited research, the extent of control of the elite of San Andres over the commoners of Joya de Ceren remains unclear. Therefore, the author recently conducted an archaeological investigation at San Andres. The results revealed that in San Andreas, the major occupation and construction of public architecture developed after the Loma Caldera eruption. In other words, San Andres might not have been a regional center at the time of Joya de Ceren. In addition, based on these findings, the

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interpretation of the Joya de Ceren commoners and the nature of interaction between regional centers of the elite and villages of commoners can be reconsidered.

**Iglesias, Christina (California State University, Los Angeles), Samantha Lorenz (Contested Caves Archaeological Project) and Toni Gonzalez (University of California, Santa Barbara)**

**[157]** *Redefining the Relationship between the Surface and the Subterranean at Mul Ch'en Witz, La Milpa, Belize*

One of the many unsettled issues in chultun research is the relationship of chultunes to surface architecture. At Mul Ch'en Witz, located within the large Maya site of La Milpa in northwestern Belize, the chultunes are covered by low, rectangular rubble core platforms so that each is an architectural complex with both a surface and a subterranean component. This degree of formalization of the surface space had not been previously reported until recently at RB-25-A5, a collapsed chultun also located at La Milpa. Data on the surface construction of chultunes at Mul Ch'en Witz along with speculation on its significance will be presented here.

**Iizuka, Fumie (University of California, Merced), Masami Izuho (Tokyo Metropolitan University) and Mark Aldenderfer (University of California, Merced)**

**[155]** *Evaluating the Advent of Neolithic in Southern Kyushu, Japan, through Systematic Ceramic, Lithic, and Paleoenvironmental Studies*

Archaeologists suggest that during the transitions between the Pleistocene and the Holocene, drastic changes occurred in the lifeways of humanity. They are termed the "Neolithization processes." Changes include the advent of food production and sedentism, and the adoption of pottery and ground stones. However, case studies around the world suggest that the timings, order, and nature of the occurrence vary. More case studies are required to better understand the "Neolithization." In this study, we focus on the transitions from the Upper Paleolithic to Initial Jomon periods of southern Kyushu, Japan. The earliest signatures of sedentism are found there. Pottery was adopted at least by 14,000/13,500 years ago by hunter-gatherers. Our previous study suggested that the advent of ceramics is associated with sea level changes but the change in climate and biomes may correspond with the increase in the occupational intensity, the proportion of decorative vessels, and lithic type variability. In this study, we conducted (1) a systematic literature-based investigation of ceramics, stone tools, features, and paleoenvironment, (2) a visual analysis of pottery and stone tools, and (3) map-based research of landscapes. Our results add new understanding to our previous results on the timings of technological, behavioral, and paleoenvironmental changes.

**Ikehara Tsukayama, Hugo (Pontificia Universidad Católica de Chile)**

**[75]** *Scars of Warfare: Early Fortifications and Politics in Coastal Ancash (Peru)*

Between 500 BC and AD 500 communities of the coastal valleys of Ancash (Peru) lived in a period of increased conflict and violence. People moved to defensive locations and invested in the construction of defensive infrastructure such as: walls, moats and fortifications. These features are still visible today as scars in the landscape. Two moments have been defined in this period and are related to the Salinar and Gallinazo archaeological cultures, each characterized by different settlement patterns and defensive strategies. These differences suggest the nature of warfare changed through time. This paper presents a study of how defensive infrastructure in the Nepeña middle valley is related to changes in local and regional politics, more specifically to the transition from a balkanized landscape to the possible emergence of a unified chiefdom.

**[75]** *Chair*

**Ikehara-Quebral, Rona (Int'l Archaeological Research Institute, Inc.), Michael Pietruszewsky (University of Hawai'i at Manoa, Department of Anth) and Michele Toomay Douglas (University of Hawai'i at Manoa, Department of Anth)**

**[20]** *Cranial Vault Modification in the Mariana Islands*

Cultural flattening of the posterior skull, rare in the Mariana Islands, was recently observed in multiple human skeletons from a Latte Period site in Guam. Prior to this study, only one case of possible artificial cranial modification was reported for this region. The cranium of a young adult female from Songsong Village, Rota, was described as having "asymmetrical deformation in the occipital region consistent with artificial shaping practices." In a review of the ethnohistoric literature, journal articles, available historic preservation compliance reports, and unpublished photographs, we evaluate the extent of cranial modification in the Mariana Islands. Using these resources, we identified crania from five burial assemblages in Guam, Tinian, and Rota that appear to have been culturally modified. Since these Latte Period sites each contain an early Spanish Historical Period component, it is possible a cultural practice that unintentionally (e.g., cradle boarding) or intentionally caused cranial modification was introduced shortly after European contact in 1521. Alternatively, this may have been a long-standing Chamorro practice that has been largely overlooked in pre-Contact burial assemblages. Results of this evaluation suggest modified crania are being under-reported in the region.

Ikeshoji-Orlati, Veronica [86] see Zori, Davide

Ikram, Salima [34] see Cakirlar, Canan

Inga, Josh [95] see Ford, Anabel

**Ingalls, Victoria (The University of Texas at San Antonio) and Jason Yaeger (The University of Texas at San Antonio)**

**[142]** *Public Spaces and Polity Making in Maya Hinterland Communities: A Case Study from San Lorenzo, Belize*

Public structures in the Maya region materialize ideologies and define centers of power as they create politically charged sacred landscapes. These locations are nexus points for community and polity making processes, embedding social hierarchies, ideologies, and social memories into the physical landscape. However, archaeologists have historically focused attention on monumental public spaces within large civic-ceremonial centers, and relatively little attention has been given to public spaces within rural communities. Yet it is at these public structures and spaces that entanglements of both top-down and bottom-up processes are visible to archaeologists. To explore the ways in which hinterland or 'rural' communities may integrate and articulate with larger 'heartland' seats of power, this paper will examine one such public group at the hinterland site of San Lorenzo, Belize. Data demonstrates that this group was used and modified by the local community from the Preclassic to the Terminal Classic periods. Its proximity to the large center of Xunantunich and the continual use of this space over centuries suggests that this group played an enduring role in the socio-political integration of the San Lorenzo community and Xunantunich polity.

**Ingraham, Robert, Sky Heller (University of Maine, Orono), Brian Robinson (University of Maine, Orono) and Kristin Sobolik (Wright State University)**

**[294]** *"Left for the Tide to Take Back": Specialized Taphonomic Mechanisms at Play in a Coastal Maine Seal Hunting Camp*

Archaeological investigations at Holmes Point West (Maine site 62-8) on the eastern Maine coast have yielded potential indicators of cultural treatment of seal remains that vary between two primary species: harbor seal (*Phoca vitulina*) and gray seal (*Halichoerus grypus*). Analyses of these patterns required development of element-specific speciation factors for best represented elements for each species, the temporal bone of the skull, including the auditory bulla and mastoid process. Holmes Point West is situated in the midst of a high density of petroglyph sites on Machias Bay, and in the

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context of abundant Algonquin oral traditions emphasizing cultural practices that reflect respect for the spirit of hunted animals. This presentation hypothesizes cultural practices associated with bone disposal patterns within the assemblage, and trajectories for ongoing research at Machias Bay.

**Ingram, Scott (Colorado College)**

[247] *Engaging the Past for a Warming World*

Increasing the public benefits of archaeology involves more than increasing our assertions of relevance. Relevance is a vague term that is easy to assert because it is difficult to disprove. Likewise, archaeology is not a predictive science and promoting “lessons from the past” creates unrealistic expectations of archaeologists and our work. If we are to connect the past to efforts to address climate change, we need to provide specific, archaeologically-informed examples that demonstrate how the past can inform human actions to address climate change. This presentation will offer specific examples of how a long-term perspective and some knowledge of the past can (should?) influence public actions and policy decision-making. It is hoped that these examples will be shared and stimulate similar efforts that demonstrate, but do not assert, the need to engage the past for a warming world.

**Inomata, Takeshi (University of Arizona)**

[147] *Termination Deposits at Aguateca and Ceibal, Guatemala*

Excavations at Aguateca and Ceibal revealed a series of dense deposits associated with the ritual destruction of buildings. At Aguateca, such deposits were found in and around Structures M7–22 and M7–32 of the Palace Group, probable royal administrative-residential buildings. Excavators also unearthed similar deposits around Structures L8–6 and L8–7, temple pyramids in the Main Plaza. These deposits date to c. AD 810 when enemies attacked Aguateca. At Ceibal, dense deposits of broken objects were found in and around structures surrounding the West Plaza of Group D, the probable royal palace complex of the illegitimate ruler, Ajaw Bot. This complex appears to have been destroyed at the end of Ajaw Bot’s reign around AD 800 or 810. Another set of deposits were revealed in and around Structure A-14 and A-16 of the East Court, Group A, the likely palace complex of Wat’ul K’at’el and his successors during the Terminal Classic period. These deposits were most likely made around AD 900 when the Ceibal dynasty collapsed. These examples show certain variability in types and contents of deposits, but they are all tied to the ritual destruction of royal buildings at the time of dynastic disruption or collapse.

[136] *Discussant*

Inomata, Takeshi [80] see Triadan, Daniela

**Inskip, Sarah (University of Cambridge) and John Robb (University of Cambridge)**

[171] *Acts of God? Causation and Agency in Disease History*

Epidemics are often understood both by historians and by ancient people as “acts of God” which structure human lives but originate outside systemic causation, and are simply caused by the advent of pathogens. But no simple model of unidirectional causation, whether by natural agents or humans, really does justice to the situation. Disease responds to social and biological environments (for instance, settlement distributions affecting contagion, and poverty and malnutrition compromising the immune system), and it has complex effects on society. The result is a model of causation in which agency resides in systemic relations rather than single entities. This argument is illustrated by considering the Black Death in Britain (1348–50) and other diseases affecting medieval English people.

**Ionico, Daniel (McMaster University)**

[95] *The Recipes of Disaster in Northern Iroquoia: Integrating Digital Image Analysis into Petrographic Practice*

European contact with Northern Iroquoian communities brought about a series of direct and indirect consequences. These involved European-disease epidemics and a series of migrations that moved people across the landscape as refugees, captives, or conquerors. Ceramic petrography offers a way for archaeologists to understand the impacts such demographic upheavals can have on technological systems. Iroquoian potters often use a recurrent set of rock and sand types that homogenize the paste-type assemblage, yet textural data (inclusion sizes, density, sorting, roundness, and sphericity) from thin sections can be used to explore micro-style changes in pottery production. However, constraints on time and levels of experience are often at odds with point counting procedures and recommended sample sizes for statistically significant studies. In this study, I couple qualitative and semi-quantitative assessments of petrographic samples with a digital textural analysis using the free open accessed program ImageJ (v. 1.51k) and Adobe Photoshop CC 2017. With this collection of techniques, I analyzed samples from two villages in the Neutral Iroquoian Confederacy that represent before and after chronologies for a series of demographic shifts to consider how these experiences altered paste preparation practices.

**Iovino, Maria Rosa, Salvatore Chilardi (Istituto Italiano di Paleontologia Umana), Güner Coskunsu (Centro Internazionale di Sperimentazione, di Docum), Anita Crispino (Museo Paolo Orsi Siracusa) and Giuseppe Sabatino (Università di Messina)**

[85] *Lithic Raw Material Procurement and Mobility in a Geological Diversed Environmental Setting in Prehistoric Eastern Sicily*

The geological constitution of Sicily is enough complex as the characteristics of the geological units are consequences of the tectonic compression that happened between the beginning of Miocene and the beginning of the Pliocene. Three structural units are basically distinguished:

1. To the north, in the western side (towards Palermo) there is prevalence of carbonatic reliefs while in the oriental side (Nebrodi Mounts and Peloritani Mounts) there are metamorphic and terrigenous deposits
2. the central part and western center, is mainly occupied from a graben terrigenous sediment
3. the Hyblean plateau, constituted by carbonate cliffs. Three distinguishable ecological and orographic units characterize the south eastern Sicily: The Aetna volcano, the plain of Catania and the Hyblean Mounts. During Prehistoric time, thanks to this geological diversity, the sourcing of efficient lithic raw material was flourishing. Volcanic glass is virtually absent.

This paper focus on the peculiar contexts of early Neolithic Sicilian sites from eastern Sicily to discuss their strategy for lithic raw material procurement, local and exotic, and their potential involvement into the development of new mobility systems.

**Iovita, Radu (New York University)**

[329] *Behavioral Modernity (or Lack Thereof) and Its Reflection in Lithic Assemblages*

One of the most important methodological issues facing modern paleoanthropology is the so far failed matching of archaeological material with specific hominins, at least at the metapopulation level. Due largely to the plethora of scenarios produced by genetic and genomic data in the last few years, the demand for archaeological confirmation or refutation of diverse dispersal scenarios has increased. Yet our understanding of lithic assemblages is not sufficiently nuanced to answer these questions. This is compounded by research bias in some of the places of likely contact between multiple species/metapopulations, such as Eastern Europe, Central Asia, and Southeast Asia. We review the history of key definitional concepts, such as Levallois and prepared-core technology, blades and bladelets, as well as retouch intensity and tool diversity in the context of shifting fossil identities of their makers. We ponder the effect of ecology, taphonomy, and function in determining our studiable units, and propose that the answer to separating populations probably depends on multiple lines of evidence that preserve different life ways rather than individual strands of material culture. We abstract from examples of contact situations from the historical record (albeit between members of our own species) and discuss their potential outcomes.

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**Iriarte, Jose, Mark Robinson (University of Exeter), S. Maezumi (University of Exeter), Daiana Travassos (University of Exeter) and Denise Schaan (Universidade Federal do Para)**

**[213]** *Climate Change and Polyculture Agroforestry Systems: Examples from Amazonian Dark Earths*

In this presentation, we discuss pre-Columbian Amazonian Dark Earth (ADE) polyculture agroforestry systems and its implications for management and conservation efforts on Amazonian sustainable futures under current threat from climate change and development. We present and compare new multi-proxy paleoclimate, palaeoecological and archaeobotanical data from two mid to late Holocene records of land use history of ADE in Santarem (Lower Amazon) and the Itenez Forest Reserve (SW Amazonia). Our data complement the previous understanding pre-Columbian land use of Amazonian Dark Earths based on soil science and geoarchaeology by offering new palaeoecological insights into ADE in relation to resilience to climate change, crop and fruit-tree cultivation, as well as fire and forest management. Our results provide a long-term example of sustainable anthropogenic landscapes in the Amazon which can inform sustainability and climate change in tropical social systems.

Iriarte, Jose [116] see Maezumi, S.

**Isaac, Gwyneira (National Museum of Natural History)**

**[321]** *Discussant*

**Isaza, Ilean (IFAR) and Eric Vrba (EDC)**

**[260]** *The Greater Chiriquí Fringes: A Perspective from the Coiba National Park Islands on the Pacific Coast of Panama*

The islands of the Coiba National Park (CNP) are located on the continental platform of Panama and the southeastern fringes of the Greater Chiriquí cultural region. During the period of the earliest human migrations to the isthmus (ca. 13,000—10,000 a.P.) these islands were connected to the mainland, although the current state of research cannot provide evidence of being inhabited earlier than ca. 1800 B.P. Multidisciplinary research aimed to study the long-term impacts of human on the insular forest of Coiba and its neighboring islands revealed, however, that the groups that colonized them had simultaneous affiliations with their closest neighbors from the Greater Chiriquí and Greater Coclé coastal zones. This presentation will focus on the results of survey and *décapage* excavation data from three of the CNP islands revealing evidence of domestic and ritual deposits from ca. A.P. 1500—950. I will address the issue of island colonization on a critical period when the local societies began to define themselves politically and economically, as well as the fluctuations in cultural affiliations as depicted on the material culture.

**Isbell, William (SUNY—Binghamton)**

**[300]** *Huari Urban Prehistory: An Introduction to the Excavations of 2017*

From June through mid-August archaeological excavations were conducted at the Patipampa section of Huari, Ayacucho, Peru, where prehistoric constructions are not preserved on the surface. The goal of this first season of excavation was to detect and expose outlines of the built environment in approximately a hectare of space believed to contain primarily residential remains. As spatial organization becomes clear, individual architectural spaces were excavated to learn about everyday life in the capital city of Huari. This presentation provides an overview of project and its first-year results, while also contextualizing most of the other papers constituting the symposium.

**[211]** *Discussant*

Isendahl, Christian [213] see Scarborough, Vernon

Ishiki, Naho [24] see Sweeney, Alex

Isla, Johny [141] see Mader, Christian

Islam, Saiful [143] see Kistler, Logan

Islebe, Gerald [76] see Fedick, Scott

Israde Alcantara, Isabel [59] see Gonzalez, Silvia

**Israel, Stephen**

**[251]** *A Brief History of Archaeology Studies in Maryland with Biographical Sketches of Notable Maryland Archaeologists and Avocational Archaeologists, 1870 to 2018*

I began the "Maryland Archaeology: Past Portrait Project" because I came across many undocumented terrestrial, underwater, and avocational archaeologists in Maryland, and realized they provided a large range of information on Maryland's forgotten and unacknowledged archaeological activities and accomplishments. My goals for this paper were to document, to the extent possible, many of the forgotten contributors of the late 19th, 20th, and early 21st century archaeological surveys and investigations, personal artifact collections, memories, and records (1) before they are lost to memory, (2) acknowledging their contributions to the understanding of Maryland Archaeology, and (3) for compiling an early 21st century comprehensive database for future syntheses on Maryland Archaeology. Compiling the early and current archaeological surveys and investigations, and documented artifact collections, personal memories and their written records is an important first step before their memories, their records, and their artifacts disappear altogether. A cross section of biographical sketches will illustrate what surprises I found while compiling these profiles.

Itahashi, Yu [24] see Owlett, Tricia

**Ivanova, Ivana**

**[104]** *New Mexican Cuisine as Ethnogenesis*

Food is a major vehicle through which cultural identity is both formed and expressed. While foodstuffs are often consumed based on cultural practices, they are also utilized based on availability. The colonial situation in New Mexico provided a particular environment in which a new cuisine was developed, and persists to this day. The Spanish colonists brought with them both food traditions from Europe, and from Mexico, where they had been inhabitants for generations. In New Mexico, the food traditions that the colonists brought with them blended with native food traditions, thus producing the "New Mexican cuisine." By analyzing the macrobotanical remains from LA 20,000, I will attempt to understand how the identity of the site's inhabitants developed through food. The first step will be to attempt to reconstruct the cuisine at LA 20,000 by using a combination of macrobotanical archaeological data and historical data. Macrobotanical data indicates a mix of indigenous foods and foods introduced by Spanish colonizers at the site. After gaining an understanding of the diet at LA 20,000, it will be possible to observe changes in frequencies of crops over time, supplementing with data from later New Mexican sites.

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**Ives, Gay (National Park Service), Sheldon Baker (National Park Service), Christine McAllister (National Park Service) and Tim Hovezak (National Park Service)**

**[226]** *Roads, Canals, and Agricultural Fields: Widespread Landscape Development across Chapin Mesa, Mesa Verde National Park*  
Constructed roads affiliated with Ancestral Pueblo great house architecture are well documented in the cultural landscape of Chaco Canyon and elsewhere across the Colorado Plateau, but the potential for such features has received little attention on the Mesa Verde cuesta. This project examines the archaeological background and provides new insight into one such feature in Mesa Verde National Park. This feature, variously interpreted as a trail, road, and a canal, has been enshrouded in controversy since first recognized by Dr. J.W. Fewkes during his investigations in the Far View area during the early decades of the 20th century. Project investigations are expected to document widespread landscape development across northern Chapin Mesa.

**Ives, John W. (University of Alberta), Gabriel Yanicki (University of Alberta), Courtney Lakevold (Archaeological Survey of Alberta) and Kisha Supernant (University of Alberta)**

**[120]** *Confluences: Fluted Points in the Ice-Free Corridor*  
Widely assumed to be younger than Clovis forms, Corridor fluted points have been dated just once, at Tse'K'wa (Charlie Lake Cave). Given clear evidence of biotic habitability along the entire Corridor before 13,000 years ago, along with early hunting in its southern funnel, moderately dense fluted point clusters likely reflect both Clovis contemporaneous and later fluted point instances. These points were overwhelmingly fashioned on local toolstones, featuring a bimodal length distribution of some larger, relatively unaltered fluted points, plus many reworked, smaller fluted points at the end of their use life. Corridor fluted points are generally found in tertiary landscape settings rather than major kills or campsites. Consistently wide point bases (on average, greater than 26 mm) imply that shaft morphology remained little changed in the hunting of game animals including horses, bison, camels, sheep and caribou. Fluted point makers traversing the Corridor eventually met populations bearing eastern Beringian traditions; determining the degree to which diffusion or demic expansion mediated north-south interactions is a research priority. A template featuring deeper U- and V-shaped bases with multiple flutes was at play, creating geographically intermediate forms decidedly similar to Younger Dryas-aged Alaskan fluted points.

**Ives, Timothy (Rhode Island Historical Preservation and Heritage Commission)**

**[159]** *Window of Opportunity: Administering Hurricane Sandy Archaeology in Rhode Island*  
Supported by the U.S. National Park Service's Historic Preservation Fund Program, the Rhode Island Historical Preservation and Heritage Commission administered surveys of coastal archaeological sites damaged by Hurricane Sandy in Rhode Island. This paper considers, from a management perspective, some of the unique constraints and challenges of this work, including incomplete property access, bureaucratic delays, and a Tribal collaboration that fell short. The insights provided by this retrospective may prove useful to anyone faced with responding to catastrophic erosion of archaeological sensitive coastlines in the future, which we coastal archaeologists collectively anticipate.

**[159]** *Chair*

Ives, Timothy [159] see McCabe, Chris

Ivester, Andrew [90] see Ferguson, Terry

Ivory, Sarah [283] see McCriston, Joy

**Izeta, Andres (IDACOR-CONICET, Universidad Nacional de Córdoba, Argentina)**

**[316]** *Discussant*

Izeta, Andres [154] see Cattaneo, Roxana

Izuho, Masami [41] see Gillam, J. Christopher

**Izzo, Victoria, Jennifer Marla Toyne, Michael Callaghan and Brigitte Kovacevich**

**[302]** *An Osteobiography of Skeletal Remains from Holtun, Guatemala*  
Excavations at the site of Holtun, Guatemala during the 2014–2017 field seasons yielded eighteen human burials from various temporal periods and site locations. Holtun was inhabited by the ancient Maya from the Middle Preclassic (1000–300 BCE) to the Terminal Classic Period (600–900 CE). Recent archaeological investigations have identified the Preclassic period at Holtun as a time characterized by increasing social inequality, but few burials have been recovered to infer the impact of social change on individual health. This poster describes skeletal observations and analysis of the burials excavated from Holtun. Individual osteobiographies are created for each due to variation in preservation, mortuary features, and chronology. Specifically, this research will examine patterns in age-at-death, sex, presence of pathology, and cultural modification, in conjunction with mortuary data to begin the exploration of social identity as reflected in burial remains. Unique features, including dental modification, suggest some individuals exhibited elevated social status exemplified with burial in the site core. The results of this study contribute to research regarding the nuances of increasing social complexity at Holtun, and broadly contribute to our knowledge of ancient Maya life and the intersection of skeletal health and inferred social status.

Jablonski, James [52] see Casson, Aksel

**Jackson, Katherine (University of Montana) and Genevieve Mielke (University of Montana)**

**[88]** *A Comparison of Mock Excavations and Active Case Excavations*  
Performing mock excavations of human skeletal material is a common practice throughout undergraduate and graduate studies in Forensic and Bioarchaeological programs. These class sessions include instruction on correct excavation methods, mapping techniques, documentation methods, and chain of custody. Inevitably however, there are differences between mock excavations within a class setting and active homicide excavations where no professor is present and the real-life ramifications of the students' actions are dramatic. Instead of practicing for a grade, the student must aid in the deliverance of justice for the victim and work well with law enforcement while professionally executing what they've practiced in school. The goal of this presentation is to discuss real-life experiences of an active homicide excavation in comparison to how mock excavations are traditionally taught. We hope to offer insight from a student perspective to help current and future educators develop effective methods of teaching mock excavations and to prepare students for what a real excavation may entail.

Jackson, Kendal [84] see Pluckhahn, Thomas

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**Jackson, Sarah (University of Cincinnati), Joshua Wright (University of Aberdeen) and Linda A. Brown (George Washington University)**

**[40]** *Contrasting Cartographies: Mapping a Maya Site Using Multiple Perspectives*

Archaeologists routinely engage with concepts of space and materiality as we inscribe meanings onto the architecture and objects left behind by past peoples. However, in doing so, we bring explicitly modern sensibilities to our interpretations. In this paper, we consider alternative interpretations of space and materiality as described by Classic Maya people (250–900 CE). We ask: In what ways do categorizations and interpretations of space at Maya archaeological sites change when traditional archaeological spatial analyses are augmented by ones based on Classic Maya characterizations? What can be learned from identifying places of convergence and divergence between these two datasets? As part of our excavations of the site of Say Kah, Belize we have developed and used a recording system that allows us to document excavated artifacts and features simultaneously within conventional archaeological frameworks and also using Classic Maya categories. These parallel classifications, when visualized as distributions of artifacts and features within GIS, allow us to compare and contrast two sets of spatial documentation at a detailed and site wide level and explore the cultural meanings in spaces that would not otherwise appear in studies of the site created using solely modern, Western spatial and artifactual classifications.

**Jacobs, Jordan**

**[322]** *Discussant*

**Jacobson, Jodi (TRC Environmental)**

**[90]** *Broken Bones: Taphonomy vs Cultural Modification in North and Central Texas*

Until recently, highly fragmented bone assemblages in Texas were almost all attributed to poor preservation. A review of assemblages, however, indicates that while there are a high percentage of heavily fragmented medium-sized and larger mammal bone at many of these sites, bones associated with small mammals, reptiles, avian, and fish have only minimal fragmentation. A review of bone from a variety of sites with deep temporal and well-stratified context and of varying degree of preservation and fragmentation from Central and North Texas including 41DL436 (Fish Creek Slough Site), 41TR203 (Mercado Site), 41HM51, and 41WM1126 (Siren Site) are examined and contrasted. Differences in taphonomic versus human imposed bone breakage for each site are presented. Patterns in temporal variations and overall frequencies of fragmentation combined with evidence for intentional fracturing are identified to examine trends and shifts in, and methods for, marrow and bone grease extraction in Central and North Texas through time. These trends are placed within a greater context of environmental changes and reviewed as potential indicators of dietary stress and shifts in subsistence resource availability.

Jadhav, Nilesh [56] see Kim, Yong Jun

Jadot, Elsa [169] see Forest, Marion

Jaffe, Yitzchak [221] see Castellano, Lorenzo

Jaffke, Denise [130] see Lercari, Nicola

**Jajjel, Roy (University of Haifa)**

**[330]** *The Geoarcheology of Vista Alegre*

The maritime Maya site of Vista Alegre, located in the northeastern part of the Yucatan Peninsula is being investigated with the aim to achieve a comprehensive understanding of the daily life of the past inhabitants, and their interaction with their surrounding environment. Results from a sediment core campaign resolved the character, environmental associations, and ages of underlying sediments. To achieve a continuous lateral understanding of the underlying sediments, a seismic survey was conducted. The survey area covered the immediate flooded area of Vista Alegre, focusing on zones that have morphologically changed throughout time, flooded during sea level rise, and which showed promise as likely locations for use during maritime activity by the past inhabitants. The seismic survey results provided evidence for sea-level rise, and revealed a ridge-basin structure that was congruous with natural trends observed terrestrially. This uniqueness could be attributed to significant differences in the submerged landscape, and possibly the presence of anthropologically-altered offshore features. The seismic interpreted data is useful both for a site scale spatial understanding of the flooded landscape history, as for aiming for potential location of marine archaeological excavations.

**Jaillet-Wentling, Angela (PENNDOT) and Samantha Taylor (Indiana University of Pennsylvania)**

**[53]** *Building a Public Archaeology Effort Finding the Best Foundation Somewhere between Bedrock and Shifting Sands: Public Archaeology Efforts at Pandenarium (36ME253)*

Small-scale and volunteer-driven public archaeology efforts undertaken at the site of Pandenarium (36ME253) aim to bring the results and practice of archaeology to many publics with recent outreach efforts including partnerships between state agency personnel and university archaeology programs, fieldwork opportunities for volunteers, interviews with local media, and presentations at local, regional, and national conferences. With changing methods and times, our definition of hybrid professionals (Jeppson, 2005) can be characterized as in flux when they move beyond the formal definitions of applied, theoretical, academic, or even compliance-driven public archaeological efforts to informal volunteer-based programs. While not necessarily a novel approach, an effective partnering of research and socio-political interests paired with the experience and willingness of off-duty professionals can provide a foundation for future research and volunteer organizations. Not everybody needs to build on the bedrock of fully-funded formal programs, but shifting sands of one or two individuals will not do either. The flexibility in building informal partnerships out of professional and formal relationships allows us to move beyond concerns with who is telling the story to telling the story for those who would listen.

**Jamaldin, Sophia (University of Nevada, Reno)**

**[92]** *Paleoindian Cave and Rockshelter Use in the Fort Rock Basin, Oregon*

The Fort Rock Basin's (FRB) caves and rock shelters hold an important place in the history of Great Basin archaeology. Excavations at Fort Rock Cave by Luther Cressman in the late 1930's led him to argue for a long-standing presence of humans in the region. The subsequent development of radiocarbon dating confirmed his ideas, providing firm evidence for a considerable human population in the FRB during the Terminal Pleistocene/Early Holocene (TP/EH). Although most caves and rock shelters probably served as logistical and/or cache locations throughout prehistory, the substantial TP/EH archaeological deposits recovered from Fort Rock Cave, Cougar Mountain Cave, and the Connley Caves suggest residential occupations. Using a central place foraging model, I test the hypothesis that those caves served as longer-term residential camps from which peoples came and went (i.e., central places). I present an analysis of source provenance data generated on extant collections of obsidian projectile points, evaluating patterns of Paleoindian toolstone use as a baseline for interpreting the occupation spans at the FRB caves and settlement-subsistence strategies of early groups in the region.

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**Jamison, Thomas and David Mixter (Binghamton University)****[129]** *Public Architecture and Space at Actuncan*

Monumental architecture and public spaces provide primary contexts for community ritual and social action. The process of construction of public architecture involves community cooperation and collective action, with the latter contributing to significant changes in the form and use of structures through time. The public architecture of Actuncan developed from the Preclassic period to constitute a nearly complete set of architectural forms devoted to ritual, administrative and community functions. The excavations at Actuncan over nine seasons have documented much of the development of the center and history of individual structures. This paper traces the development of the public architecture, public spaces and the changes to individual structures and associated deposits that inform an interpretation of the social context in which they were constructed, utilized, modified and abandoned.

**Janesko, Sarah (VCP, Alexandria Laboratory), Alison Shepherd (VCP, Augusta Laboratory), Grace Gronniger (VCP, St. Louis Laboratory) and Kevin Bradley (Alexandria VCP)****[326]** *To Be of Use: Re-examining Army Corps of Engineer's Collections*

The Veterans Curation Program has been rehabilitating U.S. Army Corps of Engineers (USACE) collections for long-term preservation since 2009. With the dual goal of training and assisting veterans with their professional goals while also archiving and curating USACE collections, this program ultimately produces high quality digital records and photographs of cultural materials from across the U.S. This paper delves into the value of USACE's digital collections for continued research, education, and public engagement. These digital records, once finalized, are uploaded to the Digital Archaeological Record (tDAR) and provide greater access of the archaeological and archival collections for researchers, teachers, and other stake holders. This paper features finalized collections that were processed at each of the three VCP labs in Alexandria, VA, Augusta, GA, and St. Louis, MO. The materials span a range of cultural materials from the Mid-Atlantic, Mid-west, and Southeastern U.S., and embrace the direction in the field toward digital preservation of material culture.

Jansson, Anna [153] see Zedeño, Maria Nieves

Jantz, Lee [90] see Devlin, Joanne

**Janusek, John (Vanderbilt University)****[333]** *Adolph Bandelier's Legacy in the Lake Titicaca Basin: Tiwanaku and Qeya Ceramic Style*

While Swiss-born anthropologist Adolph Bandelier is perhaps best known for his research in the U.S. southwest, for which the Bandelier National Forest bears his name, his research in the Bolivian Lake Titicaca region during the late nineteenth century has left an indelible legacy. Based on a brief visit of scarcely three weeks to the site of Tiahuanaco in 1894, he produced an informative document that remains vital to understanding its monuments to this day. In this paper we focus on his excavations on the Island of the Sun in Lake Titicaca, where at the site of Qeya Qolla Chico he recovered 'over 100' ceramic vessels pertaining to an enigmatic, transitional material assemblage Dwight Wallace later christened 'Qeya.' We synthesize the significance of this research and our comprehensive analysis of this collection, housed at the American Museum of Natural History, New York, in relation to other Qeya finds and collections to assess the impact of Bandelier's research on knowledge of Titicaca's pre-Columbian past.

**[300]** *Discussant*

Janusek, John [181] see Williams, Patrick Ryan

**Janzen, Anneke (Max Planck Institute for the Science of Human History), Mary Prendergast (St. Louis University—Madrid) and Katherine Grillo (University of Wisconsin—La Crosse)****[310]** *Early Pastoralists in Tanzania: Mobility and the Seasonal Round*

First developing around 8,000 years ago, pastoralism in Africa has continued as a flexible and dynamic mode of subsistence. One key feature of this dynamism is mobility, which is crucial for many East African pastoralists today to access seasonally available pasture and water. In areas of unpredictable rainfall, mobile pastoralism permits more people to live in dry lands than do other subsistence strategies. How the earliest herders in Tanzania used the landscape is still relatively unknown. Recent excavations at Luxmanda provide detailed information about early pastoral lifeways in Tanzania. Situated at the southern edge of Tanzania's Mbulu Plateau, Luxmanda is the earliest and most southern known Pastoral Neolithic site, thus providing an intriguing example of pastoral mobility strategies as herding initially took hold in Tanzania. We present the first isotopic analyses of ancient livestock in Tanzania. Carbon and oxygen stable isotope data from sequentially sampled cattle and caprine teeth provide a record of seasonal herding practices. Strontium isotopes clarify movements across distinct geologies, providing a nuanced picture of both herding over the seasonal round and possible livestock exchange among pastoral groups. Finally, these analyses throw more light on the nature of the spread of pastoralism in Africa.

Janzen, Anneke [297] see Hildebrand, Elisabeth

Jara, Kevin [154] see Zimmer-Dauphinee, James

Jarvenpa, Robert [220] see Brumbach, Hetty Jo

Jasim, Sabah [145] see Dunning Thierstein, Cynthia

**Jazwa, Christopher (University of Nevada, Reno), Chloe McGuire (Pennsylvania State University), David Zeanah (Sacramento State University) and Douglas Bird (Pennsylvania State University)****[155]** *Pre-contact Settlement Patterns in a Clay Pan and Wetland Environment in Australia's Sandy Deserts*

Much of the archaeological research done in the interior deserts of Australia has focused on rockshelter sites, primarily because of intact stratigraphy and better preservation than in open air contexts. However, ethnographic studies of local Martu populations have demonstrated that people rarely lived in rockshelters or caves, particularly during the wet season when populations focused around reliable soaks and clay pans. Therefore, it is necessary to study the distribution of archaeological sites and cultural materials in open air contexts to fully understand settlement patterns. During the 2017 field season, we conducted a systematic survey of the Wuukurta Clay Pan region in Karlamilyi National Park, less than a day's walk west of the present-day Parnngurr aboriginal community. The cultural landscape surrounding the main soak contains extensive groundstone and lithics, with the highest densities of cultural materials at the edge of the soak and two clay pans. Seasonally available water and subsistence resources attracted people to the region and provided the potential to support wet season population aggregation. This poster shows the distribution of cultural materials in Wuukurta and demonstrates the archaeological research potential of open air contexts in understudied desert environments.

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**Jean, Joseph****[123]** *Long-Term Survival of Indigenous Cultures in Haiti*

The Espanola island was disrupted by the Spanish colonial power by massively forcing Indigenous people to work in the gold mines and to cultivate fields for producing foods for the Spaniards following the Encomienda system. The rise of European imperialism conducted to share the New World where the island of Espanola was officially occupied by the Spanish and French. Massive French investments into an agricultural industry lead to a large number of enslaved Africans being transported into the colony. Long before the division of the island into two possessions, Haiti experienced significant installations of French Buccaneers operating mainly along the North coast and Tortuga Island. It is from these interactions that developed the first perceptions of the French encounter in the cultural landscape. Behind the traditional discourse, there were exclusive social categories for African, Mulatos, and White people of the colony, by using primary archives as sources, as well as historical and ethnographic perspectives, this presentation proposes to examine contributions of free and enslaved Indigenous people in the colony of Saint-Domingue and their legacies of their cultural survival in the Haitian present-day society. In addition, it will address questions of future directions for cultural landscape studies related to *longue-durée* transformations

**Jefferies, Richard and Christopher Moore (University of Indianapolis)****[241]** *Baubles, Bangles and Beads: The Role of Personal Adornments in a 17th Century Spanish Mission Period Community*

More than a decade of archaeological investigations at Mission San Joseph de Sapala and its associated Guale village of Sapala on Sapelo Island, Georgia have provided significant new insights into the nature of Spanish-Guale interaction and negotiation. Some of these cultural transactions are reflected by items of clothing or personal adornment that were worn by the Spanish and/or Native Americans who lived in that 17th century Spanish Mission community. This poster explores the nature of personal items, such as buttons, earrings and beads, worn by the mission community's Guale and Spanish residents to express their evolving personal identities and cultural affiliations in a world characterized by social, economic, and political upheavals brought on by massive population loss, demographic displacement, and the destruction of traditional Guale society.

**Jeger, Rujana (None) and Darcy Morey (Radford University)****[212]** *When Dogs and People Were Buried Together*

Throughout prehistory, dogs and humans have sometimes been interred together in the same grave, in different locations in the world. This practice raises the question of why this practice was so prevalent. Circumstances leading to this practice were variable, but its consistency suggests an underlying factor in common. Using one of the earliest known cases as a point of departure, Bonn-Oberkassel from Germany, we suggest that this underlying factor in common is that dogs and people were regarded similarly. Further, as part of developing that framework, we suggest that in certain cases, simultaneous human-dog interments may not so much have reflected one or more dogs being buried with people, but rather one or more people being buried with dogs.

Jelinek, Lauren E. [72] see Slaughter, Mark

**Jenkins, Emma (Bournemouth University), Samantha Allcock (Plymouth University), Sarah Elliott (University of Exeter), Carol Palmer (Council for British Research in the Levant) and John Grattan (Aberystwyth University)****[4]** *Phytoliths, Geochemistry and Ethnography: A Multi-method Approach for Interpreting the Neolithic Sites of WF16 and 'Ain Ghazal*

Understanding Neolithic sites in southwest Asia is often difficult because of the lack of preservation of organic remains and the effects of various taphonomic processes that alter the original record. It is, therefore, critical that we maximise the information that can be acquired from these sites. Here, we use an ethnographic approach to test the potential of using plant phytoliths and geochemistry to aid our interpretation of southwest Asian Neolithic sites. We sampled two Neolithic sites-WF16 and Ain Ghazal-and one ethnographic site-Ai Ma'tan-a recently abandoned stone and mud constructed village. Here sampling could be supplemented by information gained from informal interviews with former residents, which furthered our understanding of how the phytolith and elemental concentrations formed. We sampled distinct context categories such as 'middens', 'storage features', and 'roofs and roofing material'. Our results found that certain categories from all three sites showed similar patterns in their phytolith and elemental signatures such as 'storage features', 'floors and surfaces' and 'fire installations' whereas others were quite distinct for example 'pisé walls'. These results demonstrate that phytolith and geochemical analysis can greatly improve our understanding of southwest Asian Neolithic sites.

Jenkins, Dennis [126] see Blong, John

Jenkins, Dennis [47] see Shpall, Cahill

Jenkinson, Clay [36] see O'Briant, Kevin M.

**Jenks, Kelly (New Mexico State University)****[39]** *On the Road Again: Archaeology on El Camino Real*

In 2017, graduate students enrolled in a cultural resource management class conducted a week-long documentation and surface collection project at Paraje San Diego, a popular historic campsite on El Camino Real de Tierra Adentro National Historic Trail. The Camino Real once connected the Spanish colony of New Mexico, founded in 1598, to the markets and governing authorities in central Mexico. After Mexico won independence from Spain it served as a commercial corridor between Mexico and the United States. Following the Mexican-American War, it hosted American soldiers as they battled Apache raiders, and later each other, in the Civil War. In all of these periods, and in the decades that followed, travelers stopped at Paraje San Diego to rest and fill up on water. Preliminary analysis of the types and locations of historical-period artifacts recovered from the site provides some insight into the dates and nature of these different encampments.

**Jennings, Justin (Royal Ontario Museum), Patricia Knobloch (Institute of Andean Studies) and Elizabeth Gibbon (University of Toronto)****[211]** *Who Founded Quilcapampa? Wari Agents, Social Network Analysis, and the Unfurling of a Middle Horizon State*

At the beginning of the ninth century AD, a Wari-affiliated settlement was founded in the Sihuas Valley of southern Peru. Celebrants ritually smashed face-necked jars when they abandoned the site less than a century later. These vessels likely represent elites or ethnic groups in the Wari sphere—agents whose associations in conflict or cooperation can be used to tell a more dynamic story of the founding of Quilcapampa during this turbulent era of Wari state expansion. This paper uses social network analysis (SNA) to explore the relationship between Middle Horizon agents throughout Peru based on site provenance and artifact co-occurrence. We suggest that SNA hints at a series of changing relationships between agents that speaks both to the complexities of Wari governance and the reasons behind the creation of sites like Quilcapampa.

**[300]** *Discussant*

Jennings, Thomas [81] see Jones, Katherine



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**Jensen, Anne (Bryn Mawr College)****[135]** *Salvaging Heritage and Data from Walakpa: A Case Study of the Walakpa Archaeological Salvage Project (WASP)*

Walakpa is an iconic Arctic site with spectacular preservation. Sadly, the once stable site began eroding rapidly in 2013, with ongoing erosion outpacing attempts to obtain traditional funding for excavation. The loss of cultural heritage led to growing international volunteer efforts, starting in 2015, with support from the landowner (an Alaska Native village corporation) and many individuals. I will discuss both the success and challenges of this type of project. Walakpa is only one of many significant sites threatened by various aspects of climate change. I will discuss the implications for our future ability to contribute to the expansion of scientific knowledge of the past and thereby to sustainable and resilient communities for the future.

**[247]** *Discussant***Jenz, Trisha (University of Wisconsin Oshkosh), Sarah Ledogar (University of New England) and Jordan Karsten (University of Wisconsin Oshkosh)****[304]** *Dogs of Death: An Evaluation of Canid Remains from a Mortuary Eneolithic Cave Site in Ukraine*

Burials of dog skulls and full dog skeletons have been uncovered at several Eneolithic Tripolye (5100–2900 cal BC) sites suggesting that dogs held a special symbolic role for the Tripolye compared to other domestic fauna. To evaluate human-dog relationships in Tripolye culture and funerary context, we examined dogs from a single mortuary site (Site 17) located in Verbeba Cave (3951–2620 cal BC), Ternopil Oblast, Western Ukraine. Symbolic representations of canids have been observed on some pottery sherds found at the site. The faunal sample (n=7560) from Site 17 contains mainly domestic mammals (n=1389, 18%) and shell (n=577, 8%). Canids (n=122) are rare and comprise around 2% of the faunal sample and only 9% of the domestic fauna. The dog remains are from at least six individuals—three adults and three subadults. Individual teeth were the most common dog elements recovered, including two perforated canines and one perforated lower first molar. These teeth may have been a component of body ornamentation that was incorporated into the Tripolye burial practices or deposits. The other dog elements found in context with other feasting deposits suggest that they were consumed as a part of Tripolye mortuary ritual.

**Jeremiah, Kristen (Public Archaeology Laboratory, Inc. (PAL)) and Dianna Doucette (Public Archaeology Laboratory, Inc.)****[294]** *Written in Stone: 10,000 Years of Activity at the Acushnet LNG Site*

The Acushnet LNG Site is a multicomponent Native American campsite located along the Brayton Point peninsula in southeastern Massachusetts. Brayton Point extends into the Mount Hope Bay, at the confluence of two major rivers—the Lee and Taunton rivers—an area with numerous documented Native American campsites and ceremonial sites. Cultural resource management investigations identified an extensive archaeological site, measuring a minimum of 71,000 square meters, that was occupied from the Early Archaic through Middle Woodland Periods based on diagnostic artifacts and radiocarbon dates. Stone piles and configurations were identified within the site by representatives of the Wampanoag Tribe of Gay Head Aquinnah and Mashpee Wampanoag tribes, who defined the stone features as components of a ceremonial stone landscape (CSL). The CSL, combined with the recovered artifact assemblage and archaeological features (fire pits and lithic workshops), indicates the Acushnet LNG Site was a significant Native American meeting place during the pre-contact period, and a valuable resource with the potential to provide new information about Native American settlement patterns along the Mount Hope Bay.

**Jerrems, William****[38]** *Pre-Clovis Evidence at Guano Mountain, Nevada*

The Winnemucca Lake basin, one of many branches of Pleistocene Lake Lahontan in northwest Nevada, is again in the headline news for early human occupation of the Great Basin. Possible horse butchering at the end of the Pleistocene, fuel storage, grasshopper caching (14,195 cal. BP) and ancient rock art add to the intrigue of an ever developing mystery behind North America's earliest ancestry. Most familiar are Fishbone and Crypt caves, a part of the Guano Mountain cave complex, where a reevaluation of storage facilities has added a new dimension to the great antiquity of the Lahontan Basin. A synthesis of the evidence found throughout the Winnemucca Lake basin is the purpose of this presentation; an analysis of that evidence is the goal.

**Jeske, Robert (University of Wisconsin Milwaukee) and Katherine Sterner (University of Wisconsin-Milwaukee)****[26]** *Early Oneota Longhouses in Southeastern Wisconsin*

Since 1998, archaeologists from UW-Milwaukee have conducted long-term, systematic excavations at the 12th-15th century Crescent Bay Hunt Club site (47JE0904). The Crescent Bay Hunt Club site is unique among early Oneota sites because of the three distinct forms of structures discovered there. This paper focuses on longhouses: portions of at least three longhouses have been recovered from the site. Evidence suggests that these longhouses are at least two hundred years older than previously dated longhouse structures in Wisconsin. Analysis of the pit features, artifacts, and burials associated with these structures provides insights into overall site organization and function. Comparison of these early longhouses with those typical of later sites illustrates the breadth of temporal and geographic variation exhibited at Oneota sites.

Jeske, Robert [26] see Edwards, Richard

Jiang, Jianxin [177] see Zeng, Lingyi

**Jiang, Leping (Zhejiang Provincial Institute of Archaeology, China)****[284]** *The Sites and Dating of the Shangshan Culture*

The Shangshan Culture is named after the site of Shangshan in Pujiang County, Zhejiang Province, China. Multiple kinds of materials from multiple sites have been dated by several radiocarbon dating labs, indicating that the Shangshan Culture spans 10,000–8,400 BP. It can be divided into three phases: a 10,000–9,500 BP early phase, a 9,300–8,800 BP middle phase, and a 8,600–8,400 BP late phase. There are 18 sites belonging to Shangshan culture that have been uncovered so far. They are distributed in the upper reaches of the Qiantang River, including 4 sites attributed to the early phase, 8 middle-phase sites, and 4 late-phase sites. The other 5 sites have been identified by preliminary survey and their precise attribution remains unclear. The pottery and stone artifacts from these sites show similarities in typology, and rice remains are commonly recovered. As a result, this area has attracted scholarly attention concerning the agricultural origins of rice.

Jimenez Alvarez, Socorro [163] see Schroder, Whittaker

Jin, Zhengyao [45] see Wu, Xiaotong

**Jodry, Margaret****[79]** *Listening to One Another: Contributions of Indigenous People to the Life and Research of Dennis Stanford*

A wealth of mentors, colleagues, and friends influence the evolution of one's approach to archaeological research. This paper reflects on Dennis Stanford's associations with native people beginning with his graduate student days involved in audio recording American Indian Oral Histories for the Doris Duke Foundation, including learning from Santa Ana Pueblo Cacique Porfirio Montoya and his wife Eudora Montoya, assisting with land claims

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for the return of Sacred Blue Lake to the people of Taos Pueblo, and traveling to Alcatraz during its occupation in 1970 to interview John Trudell and others. Dissertation research in Barrow, Alaska involved generous sharing by Inuit neighbors regarding traditional hunting methods and technology. Later, indigenous archaeologists joined his excavations in Colorado. Stanford served as chairman of Smithsonian's Department of Anthropology during the initial decade of the implementation of the NMAI Act and NAGPRA. He was involved with the Kennewick law suit against the Army Corps of Engineers for NAGPRA violation. Recently, Snoqualmie individuals reached out to share their knowledge and interpretation of the East Wenatchee Clovis Cache and Northern Cheyenne Elder, Ralph Red Fox, initiated a discussion of an ancient Algonquian oral history regarding ancestors who arrived in North America across the Atlantic Ocean.

### **Johansen, Peter (McGill University)**

**[230]** *Assembling Infrastructure, Detotalizing Communities: Provincial Infrastructure as Situated History and Landscape in British Columbia*  
Investigation of the material, spatial and temporal distributedness of large-scale, infrastructure projects holds significant potential to lay bare histories of underlying political rationales and practices that challenge overtly utilitarian narratives of public welfare and economic good. This paper investigates the differential experience and perception of a sample of state-initiated or sanctioned infrastructure projects (e.g., Hydro power lines and substations, pipelines, highways and railroads) on First Nations and non-First Nations communities in southern interior region of British Columbia. I examine 19th through 21st century intersections of settlement and other places with those of state-imposed or sponsored infrastructure as situated histories. The detotalizing effects of large-scale infrastructural projects and their conscious and unconscious rendering of ethno-centric political rationales on First Nation's settlement communities is ongoing in the face of multi-sited resistance, including community-initiated heritage management. Ironically, today, archaeological practices, situated in late 20th Century normative systematics and the constraining objectives of compliance-initiated archaeological field projects (often undertaken in the interests of furthering large-scale infrastructure), unwittingly contribute to both reductive understandings of the region's rich pre-colonial past and an overly biased sample of the archaeological record, one in which in which past cultural landscapes are analytically difficult to conceive.

John, Christian [101] see Mejía Ramón, Andrés

### **Johnen, Connor**

**[38]** *A View from the Mountains: A Test of a Predictive Model in the Southern Wind River Range, Wyoming*

This paper details the results of archaeological survey in the Wind River Range, Wyoming between elevations of 9,000 and 11,000 ft. The purpose of this survey was to test a predictive model of a specific site type (sites referred to as villages) created by Stirn (2014) and tested by Stirn in a different region of the same mountain range. Although the methods of creating the predictive model were not altered, the survey methods were significantly altered. Random survey blocks were created within the project area to better sample the landscape for archaeological sites. The use of GPS track logs allowed for quantification of survey intensity and highlighted areas that were not intensely surveyed. The distribution of sites and the quantified surveyed area were compared in order to rule out survey bias as a factor influencing the discovered distribution of sites. The model was not successful in discovering alpine village sites and the distribution of the newly discovered sites can be explained by survey bias. Comparison of lithic assemblages including tools and debitage indicate that the newly discovered sites and previously discovered village locations have differences in tool diversity and debitage:tool ratios, but contain similar attributes of debitage assemblages.

### **Johns, Mischa (Putnam County Florida Historical Society)**

**[53]** *Resuscitating a Dying City: Instilling Pride Through Public History and Archaeology*

Palatka is dying. This is not a metaphor or an over-dramatic attempt to garner pity: Census reports show that more people are moving out of the city or dying than are moving in or being born. In August of 2017 the Washington Post came down to write an obituary on the quiet river town that was once

known as the Gem of the St. Johns River. Buried in the ground and in dusty books in the historic society's museum are testaments to the city's rich historic and prehistoric past, yet few if any residents know to look...or know there is anything to look for. In a sleepy, disenfranchised river town where public schools barely mention its own history at all, efforts are under way to use history and archaeology as the backdrop to revive the Gem City's sense of pride by renovating the local historic society's museum and hosting a festival dedicated to Bartram's travels. Join us as we take a trip to a city that once bustled with life as one of the largest in Florida, and revive it by invoking a sense of pride using public history and archaeology to power our efforts.

### **Johnson, Amber (Truman State University), Rudolf Cesaretti (Arizona State University), Christina Collins (University of Exeter) and Peter Turchin (University of Connecticut)**

**[105]** *Global and Regional Frameworks for Comparing Agricultural Intensification and Productivity across Cases*

Understanding variation in the stability and productivity of subsistence strategies is fundamental to explaining patterns of variation in long-term human demography. This poster addresses under what conditions societies intensify food production at both global and regional scales using frameworks ranging from relatively abstract environmental measures to models based on detailed historical and archaeological data relating to agricultural productivity. At a global scale, the combination of effective temperature zones and aquatic resource availability is shown to condition broad patterns in the pace of intensification in a comparison of 14 archaeological sequences. Crop yield models using climatic, historical and archaeological data as inputs provide a framework for comparing changes in carrying capacity over time among archaeological cases from Latium (Italy), Kansai (Japan), and Oaxaca (Mexico). At a regional scale, a model of alternative agricultural strategies in the Maya Lowlands is used to predict which environmental variables explain regional variability in the rate and demographic thresholds of agricultural intensification. Together, we demonstrate the value of using frameworks at different levels of precision to compare archaeological cases at different spatial scales.

### **Johnson, Eileen (Museum of Texas Tech University), Stance Hurst (Museum of Texas Tech University) and John Moretti (Museum of Texas Tech University)**

**[182]** *Spring Creek Drainage—Geoarchaeological Explorations along the Southern High Plains Eastern Escarpment, Northwest Texas*

The Spring Creek drainage, part of the upper Brazos River system, is located along the Southern High Plains eastern escarpment breaks near Post, Texas. Steep and confined vertical channel incision typifies the breaks and the drainage is and was fed by numerous springs emanating from the Ogallala Formation. Geoarchaeological research along a 774m transect from Macy Fork to 222m below its confluence with Spring Creek proper has documented a continual depositional record spanning the latest Pleistocene to early Holocene (~12,000–8,000 rcy BP). The stratigraphy records the shifting form and capacity of the drainage. The sedimentary record indicates a change from fluvial sands and gravels to spring fed pond and marsh deposits. The distribution of diatomaceous sediments suggests an ~200m-diameter pond formed during the early Holocene at the confluence of Spring Creek and Macy Fork. Slopewash colluvial deposits cap the sequence in upper Macy Fork. Fieldwork documents a diverse late Pleistocene biota and the presence of Clovis to late Paleoindians. The Spring Creek drainage provides the setting for a robust exploration of multiple facets of the Pleistocene-Holocene transition as well as comparison with the Southern High Plains regional record.

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**Johnson, James (University of Copenhagen)****[196]** *Beyond the Final Frontier: Time and Materiality in the Peripheralization of Bronze Age Eurasian Steppe Pastoral Societies*

Archaeologists studying prehistoric Eurasian steppe pastoral lifeways often seek inclusion into comparative research of urbanism, craft production, and complexity. Even as these studies contribute valuable information, they also reify their place in the intellectual periphery of archaeological inquiry. This peripheralization is due to several factors. First, the Eurasian steppe is perhaps unwittingly conceptualized as a relatively timeless socio-geographical periphery to “state-level” social entities located to the adjacent south—western Asia, south-central Asia, and east Asia. Second, this peripheralization is ultimately a spatially-derived frame of mind, one that essentializes and promotes geographic and cultural space over equally important considerations of time and materiality. In the following paper, I interrogate the spatio-centric mindsets that permeate current studies of Eurasian steppe pastoral social groups; a mindset that contributes to the further marginalization of pastoral-based case studies in anthropological archaeology. To break out of this exclusionary mindset, I explore the ways in which meaning was made in Bronze Age pastoral groups through a more inclusive inquiry drawing upon ethnographic and archaeological case studies to illustrate how pastoralists engaged with time and materials (as well as space) as they undergo periods of social change and continuity.

**Johnson, Janet (The State Museum of Pennsylvania)****[148]** *Discussant***Johnson, John (Santa Barbara Museum of Natural History)****[136]** *Cave Rituals in South Central California: Ethnographic and Archaeological Interpretations*

Two different versions of a myth, one Kitanemuk and one Kawaiisu, recount the tradition of a man taken into a cave where he was instructed in sacred knowledge by animal spirits. Neighboring Chumash and Yokuts elders passed along accounts of caves being used for shamanistic purposes, in part associated with rock paintings. These ethnographic accounts imply the private use of caves for special rituals by individuals. Nonetheless, there are particular Chumash pictograph sites that appear to have been decorated for public viewing. Many researchers have argued that some were locations where sunrises or sunsets were observed during the winter or summer solstices. A survey of these sites and associated sunlight phenomena test the hypothesis that these exhibit a consistent pattern of purposeful use.

**Johnson, Kent (SHESC / Arizona State University)****[282]** *Regional Solidarity, Ethnic Diversity, and Family Networks: The Bioarchaeology of Belonging and Exclusion in the Tiwanaku Colonial Enclave in the Moquegua Valley, Peru*

During the Middle Horizon, disparate communities in the south central Andes embraced Tiwanaku corporate culture to signal their affiliation with the Tiwanaku state, yet these communities also maintained separate regional and ethnic identities through distinct cultural practices. The archaeological record of the Moquegua Valley, Peru, provides an important opportunity to evaluate processes of belonging and exclusion within Tiwanaku society. Previous research indicates members of two Tiwanaku-affiliated communities in Moquegua, Omo-style agropastoralists and Chen Chen-style agriculturalists, maintained distinct cultural identities despite living in adjacent settlements for several hundred years. However, recent biodistance research indicates that cultural boundaries did not prohibit gene flow between ethnic communities, and archaeological data from several sites are suggestive of co-residence and cultural hybridity.

This study uses bioarchaeological data from samples of human skeletal remains from five archaeological sites in the middle Moquegua Valley to develop a multiscale approach to Tiwanaku social organization. Dental anomalies and basicranial and temporal bone landmarks are analyzed to assess postmarital residence practices and evaluate how family networks traversed ethnic boundaries. Results are contextualized using mortuary and body modification data to consider how processes of exclusion and belonging evident in material culture and social practice structured sociality within Moquegua Tiwanaku communities.

**Johnson, Nadia (Penn State)****[31]** *Obsidian Exchange and Use in Early Formative Chalcatzingo*

In the Middle Formative, Chalcatzingo was one of Highland Mexico’s dominant settlements. At its peak, Chalcatzingo had a well-developed obsidian blade technology and established lines of trade with the Gulf Coast. Chalcatzingo’s role in the exchange of obsidian in earlier periods is less well understood. This paper combines geochemical sourcing and technological analysis of an Early Formative obsidian assemblage from Chalcatzingo in order to elucidate this role. Geochemical sourcing enables a better understanding of the exchange routes maintained by the emerging site, prior to its florescence, while analysis of lithic technology may reveal how blade technology arrived in Chalcatzingo, and the form in which obsidian was transported.

**[31]** *Chair***Johnson, Patrick****[255]** *Authority via Mobility: Interpreting Yamasee Ceramics*

Yamasees worked as non-missionized laborers in Spanish Florida, raided for Charleston traders, fought to expand Georgia, lived with Creek Indians, and worked as diplomats and traders in Pensacola. Letters, speeches, and testimony demonstrate that this mobility—often leading them to outnumber local occupants—allowed Yamasees to dictate terms to and take vengeance against other Native Americans as well as Europeans. Despite such authority, pottery assemblages demonstrate the frequent adoption of local practices. In so doing, Yamasees demonstrate that assemblages do not necessarily identify communities and that communities may gain local cohesion and regional authority by adopting new practices.

**[255]** *Chair***Johnson, Rachel (Tulane University)****[249]** *Animism and Agency in the Amazonian Landscape: A Consideration of the Ontological Turn Utilizing Perspectives from Modern Runa Communities*

Modern Kichwa-speaking Runa peoples inhabit much of Ecuador’s Upper Amazon. Ethnographic study focusing on Runa communities of both the Pastaza and Napo Rivers indicate these groups share many of the views, collectively known as Amazonian Perspectivism, that characterize numerous lowland cultural groups. This paper will detail some of the ways in which Runa persons perceive and interact with their environment, focusing on relations with socially salient plants and animals thought to be persons, or rather, former persons who became distanced from human society through quilla, or “laziness.” I will argue that these interactions are an important form of social and economic adaptation within a broader ontological framework in which human–nature relations take on a highly social quality. This paper will also link modern perspectival views to the archaeological past through the consideration of the ontological turn, which posits that the ancient past may be best understood through the use of modern non-western ontologies. I argue that, at present, the application of non-western ontologies is complicated by the problematic creation of theoretical abstractions grounded in such ethnographic analogy.

Johnson, Rachel [6] see Schroll, Andrew

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**Johnson, Susannah (Utah Valley University) and Karen Schollmeyer (Archaeology Southwest)****[91]** *Gaming Pieces in the US Southwest*

Tabular pieces of worked bone, commonly referred to as gaming pieces, have been found in archaeological sites throughout North America and the US Southwest. This project focuses on gaming pieces in Southwestern archaeological sites, with an emphasis on the Gila River basin. Data on gaming pieces in this area are compared to the Great Basin and surrounding regions, where much of the current research on these items has been focused. The analysis and comparison of context and other characteristics of known occurrences of gaming pieces in the Southwest informs a larger picture of how these gaming pieces may have been used in the past.

Johnston, Kevin [18] see Paine, Richard

**Johnston, Susan (George Washington University)****[144]** *Ireland in the Iron Age: Interaction, Identity, and Ritual*

The relationship between Ireland and both Britain and continental Europe has often, both explicitly and implicitly, cast Ireland as either subsumed under the "British Isles" or as being "peripheral" to cultural life there and on the Continent. This terminology simultaneously ignores the unique aspects of Irish social and cultural life while suggesting that any study of culture there is not relevant to a broader understanding of the human experience. However, the archaeological record suggests a situation which is more nuanced and so more complex than this terminology would imply. Ireland clearly participated in a wider cultural world while also expressing its own unique identity. These issues will be explored specifically in the context of Iron Age ritual in Ireland, where evidence suggests that cultural and social identity were being actively fashioned. Using data from excavation at the Iron Age ceremonial center of Dún Ailinne, Co. Kildare, it will be argued that ritual in this period both tied Ireland to a larger Iron Age world while providing a medium in which to create a new context for political and ritual life that differed from that emerging in Britain and beyond while still being situated in international social trends.

**[197]** *Discussant***Jolie, Edward (Mercyhurst University)****[139]** *Threads from the Present and the Past Come Together in Smithsonian Collections*

In North America, some of the largest and most well preserved archaeological collections of perishable artifacts, including objects such as string, nets, baskets, textiles, mats, and sandals, are curated by the Smithsonian's National Museum of the American Indian and National Museum of Natural History. Generally poor preservation of these items has challenged interested researchers to recover as much information as possible from them, meaning that even some of the very early, minimally documented assemblages can make important contributions. At the Smithsonian's NMNH and NMAI, the availability of such material, combined with extensive collections of ethnographic weavings, facilitates engagement with both ancient and contemporary weaving traditions in ways that helps maximize what we can learn from the limited archaeological record. Drawing on long-term work with Smithsonian collections, this presentation considers first the insights obtained from a study of little-known historic Plains coiled gambling baskets with implications for understanding the precontact origins of that complex. Second, I review results of research on prehispanic Chacoan (ca. A.D. 850–1150) perishables from New Mexico that has yielded new data about these crafts in Chaco Canyon and beyond, and which also raises interesting new questions about recent Pueblo peoples' weaving traditions.

Jolie, Edward [48] see Lee, Craig

**Jones, Alexandra (Archaeology in the Community)****[148]** *Discussant***Jones, Catherine (University of Wisconsin-Milwaukee)****[107]** *The Problem of Enacting Ethical Practice in Historic Cemetery Excavation*

The excavation, reburial, and permanent curation of human remains from historic cemeteries is inherently linked to complexities of Western paternalism, medical consent, nationality, traditional cultural practice, and a too-common absence of stakeholder engagement, among other pressing concerns. These important and fundamental considerations are often ignored or glossed over in both archaeological project planning and in publications utilizing these remains. The ideal of scientific objectivity inherently separates the researcher from the material, a suitable principle for particle physics but not for human remains. In order to ensure that active engagement in ethical discussion is a continual practice and not a cyclical concern-of-the-moment, we as researchers must consciously embrace the full range of our position as social actors as we seek to embrace a multiple consciousness at the intersection of divergent modern communities and judicious excavation.

**[107]** *Chair*

Jones, Douglas [68] see Caporaso, Alicia

**Jones, Emily Lena (University of New Mexico), Cyler N. Conrad (University of New Mexico), Caitlin Ainsworth (University of New Mexico) and Stephanie Franklin (Santa Fe National Forest)****[115]** *Turkey Husbandry at Pueblo Bonito and Its Relationship to Turkey-Human Interactions in Chaco Canyon*

Domestic turkey (*Meleagris gallopavo*) husbandry at Chaco Canyon has been the subject of considerable debate. Previous research has argued, among other things, that turkeys were rare in the Canyon (Akins 1985); that turkeys first were a source of feathers for ritual and ceremonial activities, and only later treated as food (Akins 1985; Badenhorst et al. 2016; Windes 1977); that local wild turkeys were not present in Chaco Canyon and domestic turkeys were imported from the Four Corners region (Vivian et al. 2006); and that local domesticated and/or wild turkeys were husbanded within the canyon (Grimstead et al. 2016; Speller 2009; Speller et al. 2010). In this paper, we use turkey bone and turkey eggshell remains recovered during the 2013 re-excavation of Room 28 at Pueblo Bonito to address some of these controversies. Our results suggest that turkeys were likely husbanded at Pueblo Bonito (and possibly elsewhere at Chaco as well), and that site excavation histories may be biasing our interpretation of the turkey-human story at Chaco Canyon.

**Jones, Eric (Wake Forest University)****[119]** *A Multiscalar Analysis of Piedmont Village Tradition Settlement and Demography, 1200–1600 CE*

This research uses settlement area of Piedmont Village Tradition (PVT) sites from the four major river valleys in the North Carolina Piedmont to describe demographic trends on multiple scales during 1200–1600 CE. It uses surface survey results and artifact styles to establish sizes and dates. Spatial data and radiometric dates from excavated sites in each valley are used to refine these data. Given the limitations of using surface survey data for estimating demographic characteristics, this work aims to establish an initial model for population sizes and changes in the Piedmont on several scales that can be tested and improved upon in the future. Previous work suggests population growth occurred across the valleys from 800–1200 CE. Findings in this research suggest that populations in different valleys experienced different trajectories during the subsequent 400-year-period. Intra-

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valley migrations and eventual abandonment marked the Yadkin; population growth, settlement coalescence, and eventual abandonment in the Dan; and population stability and settlement coalescence in the Eno and Haw. Contextualizing PVT demography in the larger Southeast will help us understand how small-scale societies compared to neighboring chiefdoms, chieftaincies, and confederacies and what that means for the relationship between sociopolitical form and different demographic trends during this period.

[119] *Chair*

**Jones, Garrett (Morehead State University / The Craft Academy), Timothy Hare (Morehead State University) and Mike Dowell (Mobile Recon Systems LLC)**

[190] *An Integrated Heavy-Lift Unmanned Aerial Vehicle (UAV) and Remote Sensing Platform*

We describe an integrated heavy-lift unmanned aerial vehicle (UAV) and remote sensing platform used to map archaeological features under the forest canopy in the northern Yucatán. We collaborated with Mobile Recon Systems Inc. to construct a UAV-based aerial mapping system that can be used to create high-resolution maps and 3D models of archaeological ruins, excavations, caves, and cenotes for small to medium-sized areas of the forested environment. The system integrates Light Detection and Ranging (LiDAR) and multispectral sensors with RGB light cameras into a large UAV for simultaneous recording of visible light, near-infrared, and topographical data. The major components include the UAV, sensors, inertial measurement unit, dual channel GNSS receiver and base station, radio transmitters, control points, and mission control equipment and software. Our goal is to create a practical and cost-effective system to facilitate rapid and accurate mapping of archaeological remains and associated environmental features.

**Jones, J. Scott (University of Kentucky)**

[127] *Paleoindian Site Formation in the Tennessee River Valley*

The Paleoindian occupation of the unglaciated eastern woodlands has generally been characterized by distributions of projectile points and few true sites. While this perception has begun to change in recent history, the Late Pleistocene archaeological record beyond projectile points including sites and settlement patterns remain poorly studied and reported. This paper provides an evaluation of the natural and cultural formation processes associated with Paleoindian occupation in the Tennessee River Valley. Natural process emphasize dynamic environmental conditions, coupled with resource availability, primarily including changes in riverine drainage dictating Paleoindian site location. The cultural processes involved in site formation have often been juxtaposed as aggregations of small bands of highly mobile hunter-gatherers vs. re-occupation by single bands of hunter-gatherers. Evaluation of the data derived from the Late Pleistocene Carson-Conn-Short site (40Bn190) in the Lower Tennessee River Valley suggests other factors beyond the traditional aggregation/re-occupation models are important in site formation. The data presented here also raises important implications for modeling the development of sedentism and horticulture in the Midsouth.

[127] *Chair*

**Jones, John G. (Archaeological Consulting Services)**

[274] *Early Settlement on the Island of Grenada: Ecological Evidence for the Extinction of Rodents and Palms*

Evidence of Archaic age settlement with possible rodent harvesting is apparent in two well-dated sediment cores collected in northeastern Grenada. At around 3600 BC, large scale burning on the island coincides with severe forest modification including the total elimination of at least two species of palms. The selective, though possibly unintentional, removal of economically valuable palms suggests the influence of a non-human variable into the equation. I propose that the removal of a seed-dispersal agent, possibly an agouti or a hutia, might play into the removal of these palms, already in a weakened state due to large scale human-caused fires.

**Jones, Katherine (University of Georgia), Ashley Smallwood (University of West Georgia), Thomas Jennings (University of West Georgia), Jerald Ledbetter (Southeastern Archeological Services, Inc.) and Charlotte Pevny (SEARCH, Inc.)**

[81] *Paleoindian and Early Archaic Southeast: Twenty Years of Georgia Archaeology*

In the twenty years since the O'Steen and Ledbetter et. al chapters in *The Paleoindian and Early Archaic Southeast*, a great deal of work on the earliest occupations of Georgia has occurred. In this paper, we review recent fieldwork and collections research that have contributed to our understanding of Georgia's early record, update distributional data of Paleoindian and Early Archaic diagnostics across the state, and compare this diagnostic distributional data with raw material distributions across the state. We then use this data to consider models for the Pleistocene and Early Holocene occupations of Georgia, paying close attention to raw material distributions and possible implications for shifting group interaction patterns over time.

**Jones, Kelly (Florida Gulf Coast University) and William Locascio (Florida Gulf Coast University)**

[52] *A Typology of Late Archaic Ceramic Evidence from Okeechobee Basin to Determine Regional Interactions*

Analysis of ceramic sherds collected during excavations at the Wedgworth Midden (8PB16175) permits insight into regional interactions during the Late Archaic period. Saint John's Plain, a chalky ware associated with people to the north of the Okeechobee Basin, constitutes a significant proportion of the assemblage and suggests that Late Archaic communities in the Northern Everglades maintained social interactions with people living in the St. Johns River Valley. While preliminary, these patterns offer evidence that south Florida cultures were involved in local and non-local activities that might have included exchange of resources and ideas during the Late Archaic period.

**Jones, Lila (Museum of Texas Tech University) and Eileen Johnson (Museum of Texas Tech University)**

[241] *3D Geometric Morphometrics Applied in the Identification of Canis spp. Specimen from a Historic Site in Western Texas*

Whiskey Flats, an archaeological site on the Llano Estacado (western Texas), is dated to the mid-18th century and represents Comanche occupation. Ongoing fieldwork has produced a vertebrate assemblage that includes coyote (*Canis latrans*) and a larger canid (*Canis* spp.) of a species that remains undetermined. The species of canids that may have been present at the time of deposition are grey wolf (*C. lupus*), coyote, domestic dog (*C. lupus familiaris*), and possibly red wolf (*C. rufus*). The *Canis* spp. is represented by a small, non-diagnostic sample (n=15). In the absence of diagnostic elements such as a skull or mandible, three-dimensional landmark-based morphometric analysis is applied to the right astragalus to determine the viability of the specimen as an indicator of species. Principal component analysis (PCA) is performed using astragali from modern comparative samples of grey wolf, coyote, dog, and red wolf in an attempt to characterize quantitative variation and ultimately, determine if species identification is possible. The methodology has proven useful in exploring the range of variation among the canid species and results indicate that *C. latrans* is the least likely candidate. Dog or red wolf would prove significant, the former culturally and the latter in range and habitat.

**Jones, Makensie (Dickinson College), Isabel Figueroa (Dickinson College), Katherine Knothe (Dickinson College) and Maria C. Bruno (Dickinson College)**

[334] *Archaeology at Camp Michaux: A Productive Collaboration between Dickinson College, Cumberland County Historical Society, and Governmental Agencies in Cumberland County, Pennsylvania*

Since 2013, the Dickinson College Archaeology program has partnered with the Cumberland County Historical Society, the Pennsylvania Historical and Museum Commission, and PennDOT to conduct research in the Camp Michaux area of Michaux State Forest (Cumberland County, Pennsylvania). This partnership functions through the Archaeological Methods course offered by the college each spring, which teaches students how to plan and

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execute their own small research projects involving remote sensing, pedestrian survey, feature mapping, and test pit excavation. Students design their investigations around questions about one of the multiple phases of occupations at the site: Prehistoric/Indigenous, Farm/Iron Furnace, Civilian Conservation Corp Camp, and WWII Prisoner of War Camp. Despite time constraints and other limitations inherent in the nature of a semester-long class, yearly public presentations that involve the local community disseminate new information about what was learned and improve public understanding of the site. The partnership between Dickinson College and local heritage and government agencies has proved successful in working towards the preservation of regional archaeological and cultural heritage resources, while continuing to look toward the future of the project.

**Jones, Mica (Washington University in St. Louis) and Ruth Tibesasa (University of Pretoria)**

**[198]** *Bridging the "Kansyore gap": Continuous Occupation and Changing Subsistence Strategies at Namundiri A, Eastern Uganda*  
Environmental heterogeneity and climatic instability in the mid-Holocene (~8,000–3,000 BP) are linked to increased socioeconomic diversity in East Africa. Increasing aridity ca. 6,000–5,000 BP encouraged early herders to migrate south into the region, while local hunter-gatherers intensified their reliance on ecologically-rich environments. Kansyore hunter-gatherers of the Lake Victoria basin established specialized subsistence systems that incorporated heavy pottery-use and seasonal site occupation at this time, possibly in response to decreasing rainfall. A gap in the archaeological record, however, limits understandings of Kansyore strategies in relation to environmental reorganization. Evidence from western Kenya suggests Early (~8,000–6,000 BP) and Late phase occupations (~3,500–1,500 BP) associated with changes in the frequency of pottery production/use, ceramic style, and fishing strategies, yet no evidence exists for Kansyore activities between these periods. Recent excavations at Namundiri A in eastern Uganda reveal a long archaeological sequence without breaks in the stratigraphic or material record. Faunal and ceramic data shows clear patterns of subsistence change similar to those observed between the Early and Late Kansyore, suggesting that this Kansyore "gap" is the result of incomplete radiometric data and a dearth of targeted research in the region, rather than a break in occupation during the mid-Holocene.

Jones-Cervantes, Shelby A. [74] see Cox, J. Royce

**Jordan, Keith (California State University, Fresno)**

**[209]** *Possible Maya Analogs and Antecedents for the Pyramid B Atlantid Columns, Tula*  
Classic Maya stelae have been proposed as precursors for the Early Postclassic stelae at Tula and the relief pillars of Pyramid B at the site in previous scholarship. While suggested Maya connections for the Tula stelae are often overstated, and local central Mexican stela traditions as well as ideas from Oaxaca and Guerrero also probably contributed to the genesis of these monuments, the role of Maya contacts remains plausible. Here I explore possible Maya analogs, including stelae, for the famed atlantid columns of Pyramid B. While in style and construction these sculptures reflect the legacy of Teotihuacan, their use of elite or royal images as literal pillars has conceptual parallels in Classic Maya stelae equating kings with trees, pillars of the sky and the axis mundi. I also critically assess the possible connection, first proposed by Kubler, between the Tula atlantids and the Terminal Classic figure columns of the Puuk area. While these similarities may reflect a common Mesoamerican background rather than direct contact, recent dating of the Tula sculptural style to 650–850 CE at Tula Chico increases the probability of interaction.

Jordan, Peter [50] see Admiraal, Marjolein

Jorgensen, Alex [20] see Ladefoged, Thegn

Jorgenson, Matthew [184] see Cassedy, Daniel

Jorgeson, Ian [103] see Burger, Rachel

**Joseph, J. (New South Associates)**

**[236]** *Discussant*

**[326]** *Chair*

**Joshel, Sandra (University of Washington)**

**[308]** *Roman Slavery*

In the last 20 years, Roman archaeologists have analyzed the remains of Roman streets, counted graffiti, benches, and doorways in Pompeii and Herculaneum, and mapped the spaces of houses, workshops, and villas, and examined as well as the location of objects. Archaeologists have turned the material remains into facts and assembled an archive of the traces of human activities—traffic, movement, work, rituals, etc. How this scholarship has furthered our understanding of a heterogeneous population of men and women, rich and poor, free and slaves, Romans and foreigners is another matter. In *The Material Life of Roman Slaves*, Lauren Petersen and I sought to retrieve and represent the physical environment and lives of Roman slaves by setting in dialogue the textual record of Roman law and literature on slaves and the archaeological remains and by drawing on the work of archaeologists and historians of slavery in other periods and places. I want to focus on the Haitian historian and theorist Michel-Rolph Trouillot to Roman archaeology. The goal is to think about what counts as facts, the interpretation of those facts, and how some interpretations are regarded as factual history while others are seen as works of fiction.

**Joy, Shawn (Florida State University)**

**[244]** *The Trouble with the Curve: Reassessing the Gulf of Mexico Sea-Level Rise Model*

During last glacial episode, a massive amount of water was locked within ice sheets, resulting in a reduction in global sea-levels by 134 meters. The reintroduction of freshwater into the oceans radically changed global sea-levels and littoral landscapes. Over the last 20,000 years, approximately 15–20 million km<sup>2</sup> of landscape has been submerged worldwide. Sea-level rise explains the rarity of glacial period coastal archaeological sites. Understanding Florida's Paleoindians' interactions with the coastal environment requires an accurate sea-level curve for the Gulf of Mexico. Balsillie and Donoghue (2004) sea-level curve has been the standard model for oceanic transgression in the Gulf for over a decade. Yet, when compared to global sea-level curves, there are discontinuities within their model. This paper will address the issues with Balsillie and Donoghue (2004) curve, introduce new data and methodologies to enhance the Gulf of Mexico sea-level curve, and improve distribution modeling for submerged archaeological sites.

**Joyce, Arthur (University of Colorado at Boulder), Aleksander Borejsza (Universidad Autónoma de San Luis Potosí), Jon Lohse (University of Texas at San Antonio), Luis Morett Alatorre (Universidad Autónoma Chapingo) and Brendan Nash (University of Michigan)**

**[59]** *Sourcing Pre-ceramic obsidian from Las Estacas, Morelos, and Yuzanu 36, Oaxaca*

Understanding of long-distance exchange during the Mesoamerican Pre-ceramic suffers from a limited range of materials whose source locations can be determined relative to later periods. Obsidian is one of the few materials that can provide evidence for long-distance exchange through geochemical analysis, although relatively few sourcing studies have been carried out on Pre-ceramic obsidian. In this paper, we report recent pXRF results from

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obsidian recovered at two Preceramic sites: Las Estacas, an Early Archaic period site in the Yauhtepec Valley of Morelos, and Yuzanu 36, a Late Archaic site from the Nochixtlán Valley, Oaxaca. Our results show that in each case a single obsidian source predominates, with at least 94% of the Las Estacas sample (n=100) from Otumba and 100% of the Yuzanu 36 sample (n=31) sourced to Guadalupe Victoria. We compare the results from Las Estacas and Yuzanu 36 to Preceramic and Early Formative period obsidian sourcing data from elsewhere in Mesoamerica. Data for the Preceramic and initial Early Formative indicate that in most cases obsidian procurement was focused on a small number of sources with procurement diversifying by the later Early Formative. We discuss the implications of the evidence for means and patterns of obsidian exchange.

[192] *Discussant*

Joyce, Arthur [9] see Wedemeyer, Rachael

**Joyce, Rosemary (University California Berkeley)**

[139] *Archaeology in and with Museums: A Case Study from Honduras*

Archaeology in the US is undergoing a series of transformations, emphasizing community engaged scholarship, new research questions of contemporary relevance dealing with such things as resilience, social memory, and production of historical identity, and a shift towards non-invasive methods and intensive analyses of smaller samples from more limited excavations. Yet the normative vision of archaeological research still is original excavation of a site selected purposively to answer a question, sampled by predetermined strategies. Research with previously collected materials, especially in older museum collections, is not often presented as potentially a normative option for theses and dissertations. My own research encompasses settlement survey, excavation, and materials analyses under the normative model of archaeological research, as well as use of curated collections. In this presentation, I will describe highly productive research on Honduran archaeology that the collections of the National Museum of the American Indian at the Smithsonian have made possible, emphasizing the kinds of questions that the museum collection allows me to address that were not feasible without its holdings. I explain several strategies used in this research to provide contexts for interpretation, emphasizing the interplay between smaller, tightly controlled excavated samples and the larger collections in the museum.

[278] *Moderator*

[263] *Discussant*

**Juarez, Santiago (Colgate University)**

[18] *The Creation of Late Preclassic Urban Landscapes at the site of Noh K'uh in Chiapas, Mexico*

The site of Noh K'uh in Chiapas, Mexico is a mid-sized ceremonial center that is found near the boundary between the Southern Lowlands and the highlands of Chiapas. Abandoned during the Late Preclassic (400 B.C.- A.D. 200), the site of Noh K'uh has provided an opportunity to study the Late Preclassic settlement patterns without the overburden of later period remains. Recent investigations in 2016 and 2017 have provided new evidence that allows me to compare the construction techniques utilized in different areas of the site, ranging from the ceremonial core to the humblest occupations. Combined with previous data, the city of Noh K'uh reveals a construction program that was responsible for forever altering the landscape

that supported the site. Survey and excavations over commoner contexts provide evidence that such activities were guided by cosmological rituals, especially the common practice of centering.

**Juengst, Sara L. (UNC Charlotte), David Hansen, Sergio Chavez (Central Michigan University) and Stanislava Chavez (Wayne State University)**

[335] *Across the Lake: Interregional Connections with the Tiwanaku Occupation of Copacabana*

Tiwanaku, the first expansive state in the southern Andes, established colonies in many parts of the Andes (Moquegua, the Atacama Desert, Cochabamba) and exerted influence over the southern Titicaca basin. Archaeologists have recreated daily life for people living in these places, producing many insightful studies of Tiwanaku diet, cultural bodily modifications, disease, and occasional incidents of trauma. Many colonists living far from the Tiwanaku heartland developed hybrid lifestyles, adopting some local practices while preserving other Tiwanaku traditions. The site Cundisa is located in modern-day Copacabana, approximately 60km across Lake Wiñaymarka and 90km over land from Tiwanaku. Cundisa includes a cemetery with Middle Horizon burials of 100+ individuals. While the majority of individuals were buried with Tiwanaku ceramics, isotopic and skeletal evidence suggests variation in geographic origin and lifestyles for the people buried here. In this paper, we present the results of preliminary skeletal analyses of diet, disease, trauma, and identity for these individuals and suggest the variation present in the sample indicates interregional connections between Copacabana, Tiwanaku, and the coast. This interaction is likely part of the larger processes of the Middle Horizon, when long-distance trade and movement of peoples stimulated social complexity across the Andes.

Juliusson, Árni Daniél [167] see Hicks, Megan

Junco, Roberto [69] see Castillo, Karime

Jung, Taesoo [217] see Hadden, Carla

**Junker, Laura (University of Illinois Chicago)**

[317] *Moderator*

Jurgens, Christopher [187] see Koenig, Charles

**Justinvil, Delande (Brandeis University), Jessica Leonard (Brandeis University), Hannah Plumer (Maya Research Program), Thomas Guderjan (Maya Research Program) and Colleen Hanratty (Maya Research Program)**

[302] *The Teeth Tell All: Dentition, Demography, and Paleopathology at Early Classical Mayan Site of Tulix Muul, Belize*

In 2013 a rescue mission to salvage and preserve details of the shrine complex at Tulix Muul, a Classic Maya site in northwestern Belize, yielded a Maya mural. While the arrangement of the mural at the shrine echoes notions of nobility, this rare landmark discovery lies in contrast to what we can infer about the social status of exhumed remains from the Tulix Muul archaeological site. This poster will address the multifaceted insights we can glean from certain aspects of the past life histories and social identities of the residents of Tulix Muul. An analysis of the dentition from thirteen burials illustrates how non-specific indicators of health (NSIH) relate to the varying tiers of class among Early Classic Maya communities in northwestern Belize. Subsequently, comparing these results alongside contemporaneous finds from the neighboring site of Blue Creek will emphasize the biocultural impact of class-based dietary disparities reflected in the bioarchaeological record of two communities a mere 30 kilometers apart.

Kabata, Shigeru [262] see Murakami, Tatsuya

Kabiru, Angela [99] see Hu, Lorraine

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**Kahn, Jennifer (The College of William and Mary)**

**[171]** *The Role of Short-Term and Catastrophic Climatic Events and Human-Induced Landscape Change in Society Island Cultural Transformations*

As studies of sustainability and resilience in pre-contact Polynesian societies proliferate, records of small-scale and large-scale environmental change are being refined. Yet the question of what drives social change, human actions or climatic factors, is still quite hard to discern. My case study focuses on non-human agency, particularly eroding landforms and climatic conditions, as forces of change in pre-contact East Polynesia. A Society Island case study outlines varied human responses to expected events, such as soil creep onto agricultural terraces, and cataclysmic ones, such as major landslides, tropical cyclones, and flooding. Some cataclysmic events had remarkably deleterious short-term effects, but in the long-term created more advantageous residential and agricultural conditions for the indigenous Ma'ohi. Other short-term cataclysmic events were successfully buffered with new adaptations, spurring cultural innovation. Ma'ohi efforts to combat soil erosion, due to both natural and human causes, led to remarkably labor-intensive inputs into the pre-contact socio-economic system. From a behavioral ecological perspective, both nature and culture shaped Ma'ohi habitats. East Polynesian case studies support that decision makers often lacked information about the long-term consequences of their actions, yet could sometimes rapidly adapt and integrate new forms of traditional ecological knowledge into their socioecosystems.

Kahn, Jennifer [189] see Ohman, Alexis

**Kaijankoski, Philip (Far Western Anthropological Research Group), Brian Byrd (Far Western Anthropological Research Group), Michelle Goman (Sonoma State University), Jack Meyer (Far Western Anthropological Research Group) and Manuel Palacios-Fest (Terra Nostra Earth Sciences Research)**

**[84]** *Sea Level Rise and Shell Mound Inundation within the Islais Creek Estuary, San Francisco, California*

Situated on the southeast edge of San Francisco, the Islais Creek estuary was infilled during early development of the city. Recent geoarchaeological coring searching for prehistoric sites underlying this urban landscape has documented a complex sequence of Holocene landforms deposited as sea level rise transformed the ancestral Islais Creek valley. This exploratory work also identified, in a variety of stratigraphic contexts, an extensive ancestral Native American shell mound that was occupied throughout most, if not all, of the Late Holocene. Sea level reconstruction indicates that the oldest site component was formed just above the tidal range at the time of occupation, was subsequently submerged, and is now situated over 6 meters below surface and overlain by estuarine mud. In response to progressively rising sea levels, later temporal components of this shell mound were formed at increasingly higher elevations. Paleoenvironmental analysis of diatoms and pollen reveal that during the Middle Holocene this estuary was largely freshwater, and transitioned to brackish conditions beginning around 5000 years ago. The timing of this transition raises several new questions regarding the nature of earlier adaptive strategies around the estuary and appropriate techniques for identifying older sites within this deeply submerged and buried landscape.

Kaiser, Bruce [154] see Martindale Johnson, Lucas

Kallio-Seppä, Titta [9] see Lipkin, Sanna

**Kalra, Kanika (JD School of Liberal Arts)**

**[171]** *The Agency of Monsoons in South Asia*

Every June through September, the inhabitants of South Asia welcome and celebrate the southwest monsoons. The monsoon winds are the lifeline of this region but also a major threat, inspiring societies to devise mechanisms to both harness their potential and subvert the damage they may cause. This paper analyzes prehistoric and historical responses to monsoons in South Asia in terms of their unpredictable nature, and examines how the monsoons both facilitate and constrict people's actions. In doing so, the paper compares societal responses to monsoons in the different contexts of rurality and urbanity, which each exert specific exigencies over individual and collective actions. In both situations, conserving seasonal rainwater is crucial to the sustenance of societies but an excess of that water can cause significant destruction. Poets of the past and the present allude to the vagaries of the monsoons, reflecting a society conscious of monsoons' deceits, but even today, it is nearly impossible to predict how much it might rain, when, and where. The paper thus urges archaeological studies of water infrastructure to take into consideration both human agency and the agency of the monsoons.

Kamenov, George [9] see Wallis, Neill

**Kamp, Kathryn (Grinnell College)**

**[87]** *Parents, Infants and Material Culture*

A study of over 50 U.S. parents of infants that included interviews and the recording of toys and living spaces shows that material culture does provide clues to both parental beliefs and behaviors, but, not surprisingly, the reflection is imperfect. The material presence of infants is considerable, but even in relatively affluent households much of it is often second hand and gifted, so may not directly reflect the espoused beliefs of parents. This is especially true of objects reflecting gender stereotypes. In addition, even infants interact significantly with objects that are designed for adults and adult activities rather than designated as specifically for infants or children.

**Kang, Bong (Gyeongju University)**

**[45]** *The Rock Art of Bangudae in Southern Korea: Focused on the Problems of Whale Hunting*

Many aquatic animals, such as whales, sea lions and turtles, and terrestrial animals, such as tigers, wild cats, deer, boars, and weasels, were identified on the rock art of Bangudae, located in the southeastern part of Korean peninsula. Scenes of human figures, whale hunting, boats, and net and fence hunting are also present. Some western archaeologists are suspicious about whale hunting conducted by prehistoric Korean people. They argue that there are not clear depictions at Bangudae of the actual hunting of whales. In contrast, I will put forward some indisputable images and relevant archaeological materials related to whale hunting in the region.

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**[45]** *Chair*

**Kangas, Rachael (Florida Public Archaeology Network) and Sarah Miller (Florida Public Archaeology Network)**

**[135]** *Heritage Monitoring Scouts (HMS) Florida: Pragmatic Responses to Heritage at Risk*

Heritage Monitoring Scouts (HMS) Florida, a program created by the Florida Public Archaeology Network, is designed to teach the science of climate change and pragmatic problems it poses for cultural resources. Beyond just learning about climate change science, projections, and increasing impact



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we can expect to see over the next 50–100 years, HMS Florida is specifically designed to give individuals a way to make a difference. Responding to threats posed by climate change, weather, and other sources, HMS Florida Scouts are individuals from a variety of backgrounds, professions, and skillsets that come together to monitor Florida's cultural heritage. This discussion will identify ways HMS Florida trains and mobilizes citizens, while working with state, national, and international partners to coordinate the effort and disseminate best practices and lessons learned.

Kangas, Rachael [53] see Ayers-Rigsby, Sara

**Kansa, Eric (Open Context / UC Berkeley) and Sarah Whitcher Kansa (Alexandria Archive Institute)**

[172] *Beyond Solutionism? Digital Data and Threatened Cultural Heritage*

In his influential book "To Save Everything, Click Here" (2014), Evgeny Morozov coined the term "solutionism" to describe a utopian vision that innovation in digital technologies can solve complex social problems. Fueled by Silicon Valley wealth, digital technologies have an obvious glamor. The high-profile reconstruction of the Palmyra Arch by the Institute for Digital Archaeology exemplifies how governments, universities, corporate sponsors, and granting foundations use media attention on threatened world heritage to showcase technological prowess. Do such efforts meaningfully preserve threatened heritage? Do they overshadow often tragic social realities that fuel war and other causes of heritage destruction? How likely are the data to be available, discoverable, and of any future use?

To move beyond solutionism, this paper highlights how digital data need better contextualization. Context is multi-dimensional—simultaneously physical, social, and intellectual. Contextualization requires developing "human capital" through community archaeology and public education, and sustained institutional commitments for digital curation. Such efforts cannot be siloed institutionally, intellectually, or technologically. Open Context (<http://opencontext.org>) illustrates approaches to link and integrate heritage data across institutional and community boundaries in ways that can encourage continued development of the human capital needed to make digital cultural heritage a meaningful aspect of preservation.

[316] *Discussant*

Kansa, Eric [130] see DeMuth, Robert

**Kansa, Sarah Whitcher (AAI / Open Context), Anne Austin (University of Missouri, St. Louis), Ixchel Faniel (OCLC), Eric Kansa (AAI / Open Context) and Ran Boytner (Institute for Field Research)**

[130] *Considering Communities of Practice throughout the Data Lifecycle*

The use of digital tools for data creation and presentation is pervasive in archaeology, and data preservation and dissemination is becoming common practice. Still, few archaeologists consider the life of their data beyond their own research purposes. This lack of broader consideration of the future uses of a dataset means that many researchers do not sufficiently describe their data to make it intelligible or useful to others, which risks filling repositories with data of very limited use. We present findings from the Secret Life of Data (SLO-data) project, which aims to better understand opportunities and challenges in data interpretation, publication and preservation by following the lifecycle of data from the field to the digital repository. The project's "slow data" approach emphasizes the need for thoughtful consideration of archaeological data, taking into account its curation, contextualization, and dissemination, as well as how it can contribute to broader understanding now and in the future. We share results from interviews, field observations, and excavation data assessments that our team has conducted at four field sites in three continents. We recommended technical and organizational changes to streamline data collection and management during excavations that will help improve its potential for future use.

[316] *Moderator*

Kansa, Sarah Whitcher [53] see Noack Myers, Kelsey

Kanungo, Alok [137] see Dussubieux, Laure

**Kaplan, Emily**

[139] *Materials Characterization at the National Museum of the American Indian: (Mostly) Non-destructive Analysis*

The use of portable X-Ray Fluorescence (pXRF) for in-situ elemental analysis is becoming widespread in archaeology and cultural heritage studies. Archaeologists and conservators routinely use pXRF instruments in the field and many museums use them in-house for identification of pigments, metals, and inorganic pesticide residues, characterization of minerals and determination of alloy composition. The NMAI Conservation Department has been using pXRF for over fifteen years for a variety of materials and projects. Focusing on results of a long-running technical study of polychromed Inka and Colonial Andean ritual drinking vessels called qeros, I present an overview of the utility of pXRF in the museum context. Identification of the palette of mineral pigments and metal decoration and repairs used for the qeros has contributed substantially to our understanding of chronology and production. I include examples of studies carried out at NMAI of modern, historic and archaeological collections items and discuss the value and limitations of pXRF when used alone or in combination with other analytical techniques.

Kaplan, Emily [139] see Harrison, Ainslie

**Kaplan, Jed (Max Planck Institute for the Science of Human History)**

[219] *Numerical Modeling of Hunter-Gatherer Population, Dispersal, and Influence on the Environment in the Late Pleistocene*

The expansion and dispersal of modern humans across Eurasia and into the Americas during the Late Pleistocene is remarkable for the application of niche construction, contemporaneous with megafauna extinctions and rapid climate change. Despite the importance of this period, the rate, pathways, and environmental impacts of the late Pleistocene human dispersals are poorly understood. To quantify the effects of these dispersals on the environment, and to better understand demographic development over the period, I implemented a new, computationally efficient numerical representation of human population dynamics and dispersal and incorporated this into a dynamic global vegetation model. This coupled model of human and natural systems simulates the way in which climate and other properties of the physical environment affected suitability for hunter-gatherer populations, while at the same time allowing humans to modify their local environment, i.e., niche construction, through the controlled application of wildland fire. Our model simulations show that humans could substantially influenced their environment even during the Last Glacial Maximum, selectively using fire to promote more open and heterogeneous landscapes. This anthropogenic modification of the land surface facilitated further dispersal and increases in population, a positive feedback that ultimately accelerates the growth and spread of humans across the planet.

**Kaplan, Jessica (University of California Santa Barbara)**

[17] *Political Economies of the Wari Empire: Resource Use in the Middle Horizon, Peru*

Political economies, or the "material foundations" for the institutionalization of power and control are complex and variable, within and across resources, political systems and incorporated communities (Earle 1994). During the Middle Horizon, Peru (AD 600–1000) the Wari Empire expanded from its capital in the Ayacucho highlands to cover a region of the Andes spanning over 1000km within present-day Peru. The empire embarked on large-scale infrastructural projects (roadways, agricultural terracing and irrigation works, political and administrative systems, etc.) and had a political

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economy built on a combination of strategies, including resource control and the specialized production and distribution of both utilitarian and special-purpose goods. The empire relied on the vertical ecology of the Andes to capitalize on regional resources, and to draw those regions into the Wari interaction sphere. This research seeks to understand the intersecting relationships between regions, resources and Wari power as enacted through the production, distribution and consumption of obsidian and other resources within the Wari capital and hinterland territories.

**Kara, Alex (Boston University)****[28]** *Scrutinizing Theories of Maya Collapse with the CHAAHK Spatial Simulation Model*

The Classic Maya collapse remains as both relevant and controversial a topic as ever. For over a century, dozens of researchers have proposed different causes that may have driven this complex process. The last few decades have witnessed the academic community's opinion converge on the notion that many different social and environmental factors, operating at likewise diverse scales, somehow contributed to a temporally gradual and spatially heterogeneous disruption of the demographic, political, and cultural patterns known to have characterized the Classic Maya. This paper builds on this progress by attempting to quantify the relative influence of certain factors on the Maya region's long-term trajectory. It presents an abstract spatial simulation model of Maya demography, subsistence, and trade over a 3000 year period. It implements relatively generic manifestations of what processes were relevant to the growth, collapse, and regeneration of the Maya system. This abstraction permits quicker model execution times, which then facilitates using data mining and sensitivity analysis methodology to quantify how certain stressor categories contribute to the presence or absence of long term societal collapse. The relative importance of these stressors according to the simulation is then compared to the amount of research attention they tend to receive.

Karam, Carlos [55] see Campos, Cinthia M.

**Karapandzich, Alina (The College of Wooster) and Paul Nick Kardulias (The College of Wooster)****[185]** *Zero to Hero: Elite Burials and Hero Cults in Early Iron Age Greece and Cyprus*

Adulation of heroes, including the flawed, militaristic, authoritative men of Homeric epic was an important feature of ancient Hellenic culture. This phenomenon is reflected in cults and shrines built in the Archaic period. How did these so-called "hero cults" form, and can Early Iron Age (EIA) elite burials form a connection between the tomb cults of the Late Bronze Age (LBA) and the hero cults of the Archaic and later Classical periods? The purpose of this study is to examine EIA burials whose elite goods and archaeologically visible tombs reflect the burial of a "heroic" person. In doing so, we draw connections between the elaborate LBA burials and the less ornate EIA interments of Greece and Cyprus that contain references to the LBA past. To examine this phenomenon, we consult theories of state formation, the cyclical nature of changing levels of social complexity, and cultural memory. In order to draw connections between Archaic hero cults and earlier EIA tombs, we examine burials at the following sites in Greece and Cyprus: Pylos, Tiryns, Mycenae, Athens, Lefkandi, Grotta, Phylakopi, Knossos, Mesa Moulia, Amathus, and Salamis. Additionally, Homer's Iliad and Odysseus and Hesiod's Theogony provide documentary evidence to accompany the archaeological material.

Karapandzich, Alina [274] see Kardulias, Paul Nick

**Karavanic, Ivor and Antonela Barbir (Croatian Conservation Institute)****[304]** *An Integrative Approach to Cave, Open-Air and Underwater Mousterian Sites of Dalmatia (Croatia)*

Paleolithic sites situated in the Hrvatsko zagorje region of north-western Croatia (Krapina, Vindija) are well known because they contain important finds of fossil human remains associated with both faunal remains and lithic industry. However, in recent years, work on Mousterian sites in Dalmatia (south Croatia) has intensified. It focuses on three types of sites, (caves, open-air, and an underwater site) as well as on a systematic survey of the region. This poster briefly presents one of each type of the site in the light of new research and compares evidences from these sites. While the cave site of Mujina pećina has yielded both lithics and faunal remains in a stratigraphic context, lithics from the Karanušići open-air site and the Kaštel Štafilić—Resnik underwater site were mainly collected from the surface. Although surface finds lack stratigraphic information, they contain some general technological and typological data, damage patterns, as well as information on sphericity and roundness of finds. This integrative approach to mentioned sites allows a comparison between land sites and those now under water, providing better insight into formation processes, a more complete picture of the area occupied by the Mousterian people and a clearer insight into their mobility patterns.

**Kardulias, Paul Nick (College of Wooster)****[274]** *Multi-faceted Anthropology: Recent Work of the Athienou Archaeological Project in Central Cyprus*

The Athienou Archaeological Project (AAP) has conducted multi-pronged investigations in central Cyprus over the past 27 years. The research has included excavation, survey, geophysical prospection, ethnoarchaeology, bioarchaeology, and cultural studies. The unifying thread in these endeavors has been a theoretical perspective that draws on Braudel's concern with the central role of the environment in the Mediterranean's historical development, world-systems analysis, and landscape archaeology. Field research has examined an Archaic to Early Roman rural sanctuary, a Roman to Venetian era village, and a funerary landscape with tombs (Archaic to Venetian) scattered throughout the valley. Ethnoarchaeological research has focused on a recent Turkish village, traditional agricultural practices and tools, current herding practices, local water systems, and ephemeral sites for the production of charcoal and bee-keeping. Our team has also examined the role of historic preservation in consolidating a local identity linked to restored buildings, and efforts to maintain traditional crafts, such as the manufacture of lace and production of cheese. As John White emphasized throughout his career, the holistic scope of anthropology is necessary to understand the multiple dimensions of life in the past and present. That approach has been a guiding principle for the work of the AAP.

**[274]** *Chair*

Kardulias, Paul Nick [185] see Karapandzich, Alina

**Karkanas, Panagiotis (The Malcolm H. Weiner Laboratory for Archaeological Science, ASCSA), Sharon Stocker (Department of Classics, University of Cincinnati) and Jack Davis (Department of Classics, University of Cincinnati)****[298]** *Microstratigraphic and Geochemical Contributions to the Study of the Burial Practices and Taphonomy of the Mycenaean Shaft Grave of the 'Griffin Warrior', Pylos, Greece*

Results of a microstratigraphic and geochemical approach are presented here in reference to study of the Mycenaean 'Griffin Warrior' shaft grave at ancient Pylos. Soil and sediment micromorphology are used to address questions concerning the preparation of the tomb, the mode of corpse deposition, and taphonomy of the burial. Processes and activities such as the preparation and configuration of the floor and other earthen constructions inside the tomb are considered, as well as the rapidity of episodes of backfilling both through human and natural agency. Overall, a microcontextual approach has revealed a more complicated burial history than recognized by field observations alone. Furthermore, the identification of neoformed minerals and their chemistry has enabled the detection of degradation products of human body tissue and probably also that of some of the associated cultural objects. The genesis of these minerals reflects the sequence of the opening and filling of the tomb and their identification, therefore, contributes to a more informed reconstruction of the history of the burial. The discovery of such chemical traces has important implications for their future identification in graves and our ability to distinguish between primary and secondary burials.

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Karsten, Jordan [304] see Jenz, Trisha

Kasper, Kimberly [153] see Lane, Amanda

**Kassabaum, Megan (University of Pennsylvania)**

**[295]** *Mounds at the Margins: The Effect of Temporal Frontiers on Archaeological Interpretation*

The practice of building earthen mounds has tremendous time depth in the American South, and the variation in these monuments across time and space continues to spark debates regarding their functions and social significance. A great deal of attention has been focused on the shifting functions of mounds during Terminal Woodland / Emergent Mississippian times, when platform mound-and-plaza complexes become commonplace, corn agriculture becomes the norm, and higher levels of institutionalized status differentiation develop. In this paper, I define this transition as a “temporal frontier” and interrogate the effects of the period’s marginal position on its archaeological interpretation. In particular, I draw attention to the distorting effect of archaeology’s backward gaze in examining the changes that take place at temporal frontiers and advocate for a more forward-looking approach to the interpretation of these pivotal moments. My primary case study focuses on the Late Woodland Coles Creek culture (AD 700–1200) of the Lower Mississippi Valley and the interpretation of early platform mounds. Finally, I briefly consider how the concept of temporal frontiers may be used to better comprehend the archaeology of other transitional periods in United States prehistory.

**Kassadjikova, Kalina (UC Santa Cruz), Kelly Harkins (UC Santa Cruz) and Lars Fehren-Schmitz (UC Santa Cruz)**

**[337b]** *Ancestry and Heritage at a South Carolina Rice Plantation*

During the 18th and 19th centuries, Georgetown County in South Carolina housed some of the largest slave plantations and rice agriculture in the New World. Today, the descendants of these enslaved laborers form the Gullah Geechee community and comprise a distinct African-derived creolized cultural praxis. This study concerns itself with the long-term trajectory of biological and cultural change experienced by the individuals living in the South Carolina Lowcountry. First, ancient DNA extraction and sequencing methods, population genomic models, and bioinformatic tools are used to link a group of 19th C enslaved laborers from Hagley Plantation, Georgetown county to populations in west, central, and east Africa. Then, the genetic analysis is contextualized within the cultural and social systems of the ancestral populations and the particular colonial regime operating at Hagley. Using a biocultural approach, this study aims for a better understanding of lineages severed by the transatlantic slave trade, the formation of new kinship and social networks under slavery, and conceptions of ancestry and heritage.

Kassadjikova, Kalina [337b] see Schaffer, William

**Kate, Emily (Pennsylvania State University), J. Heath Anderson (Minnesota State University, Mankato), Douglas J. Kennett (Pennsylvania State University) and John Krigbaum (University of Florida, Gainesville)**

**[48]** *A Preliminary Study of Epiclassic Human Mobility at Cerro Magoni in Tula, Mexico Using Stable and Radiometric Isotope Analyses*

In this poster, we present preliminary mobility data for ten individuals recovered from the summit of Cerro Magoni, an Epiclassic (ca. AD 600–900) hilltop settlement in Tula, Mexico. For decades it has been hypothesized that the Tula area may have experienced an influx of immigrants from northwestern Mexico during the Epiclassic period, and that these newcomers played an important role in the rise Tula Grande. Results presented here provide an important step forward towards testing the long-held migration hypothesis. Analyses of modern and archaeological faunal remains were conducted to establish local baselines for oxygen ( $\delta^{18}O$ ) and radiometric strontium ( $87Sr/86Sr$ ) and lead ( $20nPb/204Pb$ ) ratios for the Tula Grande region. These baseline values were then compared to human  $\delta^{18}O$ ,  $87Sr/86Sr$ , and  $20nPb/204Pb$  values, derived from the analysis of tooth enamel, to identify individuals who may have migrated to the Tula Valley during the Epiclassic. For all individuals included in this study, bioarchaeological, mortuary, AMS radiocarbon dating and stable carbon ( $\delta^{13}C$ ) and nitrogen ( $\delta^{15}N$ ) data previously assayed are included to contextualize these new data. These new mobility data, in conjunction with previous results, will provide further insight into the population patterns of the pre-Toltec Tula Valley.

Kathuria, Sheeji [189] see Peacock, Evan

**Katz, Gregory**

**[202]** *Digging the Anacostia River Landscape: Geoarchaeology and the Buried Past in the National Capital*

The historic Anacostia River valley was a focal point for settlement by local Native American populations as well as European Colonial and post-Colonial populations. However, the valley floor had low-topographic relief, large marshes, and soils prone to erosion, leading to many grand efforts of dredging and land reclamation. Flooding led to further raising of the landscape in the early 20th century, and to the deeper burial of archaeological sites. Fortunately, the Anacostia River valley was well-mapped in the 19th and 20th centuries, and 3D approaches to landscape visualization have recently allowed archaeologists to model the historic valley in the last half of the nineteenth century. Models of fill thickness have been generated and tested through geoarchaeological borings and trenches. While the effort is piecemeal and being refined, the landscape approach with GIS modeling has yielded encouraging results.

**Katz, Jared (University of California, Riverside)**

**[118]** *The Numerous Faces and Voices of Ancient Maya Instruments: A Typological Analysis of Ancient Maya Musical Artifacts Based on Physical and Tonal Attributes*

Over the past several years, the Maya Music Project has documented over 430 ancient Maya musical instruments. In addition to photographing all of the instruments, over 160 musical artifacts have been 3D scanned, and audio recordings were made of many of the artifacts. This paper will focus on the typological analysis of instruments based not only on their stylistic and technological attributes, but also on the tones the instruments are able to produce, as it is clear the artisans who created these instruments had a solid understanding of the manipulation of pitches. In particular, this paper will analyze several types of instruments, including specific categories of ocarinas, globular flutes, and rattles. Certain types of instruments were made more frequently than others, and this research attempts to understand the cultural significance of these categories of artifacts. This paper will also describe the use of digital experimental archaeology as a useful tool when attempting to understand the internal structure of instruments, as numerous instruments have been recreated digitally, and then 3D printed. The playable 3D prints sound very similar to the original artifacts, demonstrating the success of this experimental approach.

Kaufman, Brett [210] see Fenn, Thomas

**Kay, Janet (Princeton University)**

**[23]** *Migration, Monuments, and Memory in Fifth-Century Britain*

The fifth century in Britain is one of dramatic cultural, social, and economic change, transforming the late-Roman communal landscape into one dominated by Anglo-Saxon kingdoms. These changes have often been attributed to the collapse of the Roman Empire or the arrival of immigrants from the continent. This paper uses ArcGIS, isotopic studies, and multivariate statistics to investigate the relationship between where people came from, where they chose to bury their dead, and what they sent with them. My preliminary analysis of data from more than 9,000 burials in over 100 cemetery

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populations indicates that changes in burial practices were the result of a larger shift from a society based upon Britain's relationship with the Roman Empire to one based upon its local communities, whether composed of natives, or newcomers, or both. No matter where people came from, no two communities reacted to the upheaval of the fifth century in the same way, and there were no monolithic or universal ways of relating the past to the present and future. New practices appeared, and old practices continued, some of which were better suited to some fifth-century inhabitants of Britain than others.

**Kay, Marvin (University of Arkansas)**

**[122]** *Ashes to Ashes, Dust to Dust in Caddoan Mortuary Ritual*

Sediment of varied textures and colors, ash among them, is highlighted from deliberately burnt Harlan-style charnel houses. These were erected in sub-mound pits. In one rendition that followed an earlier house burning, light gray ash alternates in the superior, or upward, position with the black charcoal layer of a collapsed burnt thatch and cane roof. The ash was levelled as a platform. This completed a mortuary cycle linked lineally to subsequent pyramidal mound construction. In other cases this dichotomy is retained as small marker mounds of dense black clay beneath light gray ash, as charnel pits and prepared flattop mound surfaces. Fire smoke and ash likely signified the passage of souls to the upper world, of life resurrected from death; whereas the black under layer was a metaphor of death.

**Kaya, Deniz (University of Notre Dame)**

**[29]** *Burning the House: The Importance of Excavation Methods in the Study of Space and Place in the Neolithic Household. A Case Study from Neolithic Bulgaria (6500–600 BC)*

The importance of understanding the use of space and the distribution of places in the household in the prehistoric setting has been recognized by the anthropological community. Unfortunately the archaeological context often does not always favor such inquiries, especially in the prehistoric setting. Thus, the extraction of information needed to make claims on how different societies distributed living areas in the house and in the greater village, cannot always be examined in detail. For the purpose of this paper, I will examine how the sites of the Early Neolithic (6500–6000 BC) villages of sites such as Slatina and Mursalevo in Bulgaria can contribute greatly to these questions. The ritual burning of the houses from these communities, and the particularities the excavation of these houses require can contribute greatly to how archaeologists approach the first step of data collecting: excavating. I will argue that the particularities in excavation methodology are the most important step in understanding what the house was like and what role it had in prehistoric people's lives.

**[29]** *Chair*

Kealhofer, Lisa [175] see Heng, Piphal

Kearney, Amanda [180] see Steelman, Karen

**Keblar, Anna (University of Central Florida), Michael Callaghan (University of Central Florida) and Brigitte Kovacevich (University of Central Florida)**

**[37]** *Chemical Composition of Maya Slips: Analysis and Interpretation of Preclassic Sherds from Holtun, Guatemala Using pXRF Technology*

Slip, a fluid suspension of clay that is applied to the surface of a piece of ceramic, allows for increased control over the functional and aesthetic properties of the finished vessel. The potter can select a slip to provide a more appealing color, texture, and/or luster to the vessel's surface, while maintaining the favorable functional qualities of the paste. While slip color has long been used as an attribute for classification in the Maya lowlands, only recently have the raw materials of slips been used to inform studies of production and exchange, with much of this work using Late and Terminal Classic period ceramics. This paper presents the results of portable x-ray fluorescence (pXRF) analysis of the chemical composition of red, cream, and black slips on Preclassic ceramic sherds excavated in 2017 from Holtun, Guatemala. Variation, or lack thereof, in the chemical composition of the three colors of slip can suggest change in ceramic production, exchange, and differential access to pottery throughout the site. This research tests the utility of pXRF on slip and also informs models of Preclassic period ceramic production and exchange.

**Keckler-Alexander, Kristin**

**[281]** *Moderator*

**Keegan, William (Florida Museum of Natural History)**

**[323]** *Discussant*

**Keene, Joshua (CSFA, Texas A&M University), Tyler Laughlin (Texas A&M University, CSFA) and Michael Waters (Texas A&M University, CSFA)**

**[8]** *Archaeological Investigations of the Archaic and Paleoindian Occupations at Hall's Cave, Texas*

Hall's Cave is a well-studied paleontological site that has provided a detailed climatic record for the Texas Hill-country from the late Pleistocene through the Holocene. There have been no discussions, however, of the archaeological record of the cave deposits. Archaeological excavations at Hall's Cave conducted in 2017 revealed a 3 m thick, well-stratified sequence of sediments derived from the watershed outside the cave. Early deposits ranging from 18,000 to 14,000 cal yr B.P. contain the remains of horse, *Bison antiquus*, saber-toothed cat, and other species in well dated contexts. The archaeological record includes a burned rock midden, twenty hearths, projectile points, stone tools, and flakes that range from late Paleoindian to late Archaic. The hearths represent mostly short-term occupation episodes and the macrobotanical remains they contain provide a unique opportunity to understand diachronic subsistence and environmental changes for the region.

Keene, Joshua [103] see Carlson, David

**Kegerise, Cory (PA Historical and Museum Commission)**

**[204]** *Mind the Gap: Laws and Policies Related to Burial Places in Pennsylvania*

Pennsylvania has a long history of human occupation and an array of community types and settlement patterns ranging from large cities to sparsely populated rural communities. This geographic and cultural diversity resulted in varying burial practices including small family plots in farm fields, religious burial grounds, as well as private and publicly-owned cemeteries. As the state grew and changed throughout the 19th and early 20th centuries, the legislature enacted or revised laws affecting burial places and human remains in a piecemeal fashion, likely in response to specific projects and circumstances. This legal framework has not been substantially changed since the mid-20th century, leaving policy gaps that recent projects have exposed. Chief among these issues is how privately-owned, unmarked burial places are treated legally and ethically when remains are discovered, often during development activity. This session will explain the legal and policy environment for burial places in Pennsylvania as context for the 218 Arch St. project in Philadelphia.

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**Kehoe, Alice****[42]** *The Postcolonial Imperative*

Formal dissolution of European empires following WW II, as they transformed into transnational financial powers, allowed subaltern standpoints and “traditional knowledge” (TEK) to be voiced. American archaeology shifted into CRM becoming the dominant field, reflecting in part the rise of tourism as a principal global industry, with local histories a selling tool. Then NAGPRA put American archaeology into a postcolonial position. While much of NAGPRA negotiations still falls into colonialist discourse, and paternalism still rules the BIA, a postcolonial standpoint is basic: there is no “prehistory,” every community has its history and archaeologists’ work must pay attention to those histories and knowledge—a rapprochement between Enlightenment universalist premises underlying “science,” and foundational premises held by non-Western nations. A postcolonial standpoint will conflict with academics’ high valuation of Theory, which in its universalist pretensions remains colonialist discourse. For some of us, “archaeologies of listening” describes our postcolonialist approach; working with ethnohistorians is an allied postcolonial approach. The ground is shifting, like tectonic plates uplifting ranges of TEK.

Kehoe, Michael K. [67] see Ludlow, Mark

Keith, Matthew [78] see Evans, Amanda

**Kelleher, Deirdre (Temple University)****[296]** *Unearthing the Material Culture of Nineteenth-Century Irish Immigrants in the “City of Homes”: A Case Study from Elfreth’s Alley, Philadelphia, Pennsylvania*

In contrast to many other American cities, which developed distinctive ethnic neighborhoods during the nineteenth century, Philadelphia’s European immigrant populations were largely dispersed throughout the city during this period. Irish immigrants lived in every ward of Philadelphia as newcomers from various European countries settled along alleyways and courtyards throughout the city. Using Elfreth’s Alley National Historic Landmark as a case study, this paper argues that the dispersion, intermingling, and lack of segregation between immigrant groups in Philadelphia had implications for how newcomers navigated daily life and how the material culture they left behind can be interpreted as representations of material identity. A diverse population of European immigrants shared living spaces along Elfreth’s Alley during the nineteenth century, including residents from Ireland, Germany, England, Spain, Russia, the Czech Republic, and more. Archaeological investigations at two properties along the Alley did not unearth artifacts discretely linked to “Irishness,” rather an examination of the material culture of the built environment revealed common features across domestic spaces shared by immigrants from different ethnic backgrounds. The findings at Elfreth’s Alley highlight some of the challenges and limitations of uncovering material demonstrations of ethnic identity in densely populated urban contexts.

**Keller, Angela (Statistical Research, Inc.)****[129]** *The View from Below: Plaza Spaces at Actuncan, Belize*

Formal plazas constitute the majority of public space in Maya centers and yet, until quite recently, plazas have not received the same investigative attention as the impressive pyramids and palaces that surround them. This neglect is largely due to the difficulty of investigating public plazas, which typically contain few artifactual or structural indications of their ancient use. Although the identification of activity in ancient plazas is technically challenging, a dedicated investigation of plazas is nonetheless essential to our understanding of how centers functioned in Maya society. Public plazas were the venues for the bulk of a center’s daily activities from ritual, dance, and sacrifice, to market trade and the settling of disputes. This paper presents the results of two seasons of plaza-focused fieldwork at the site of Actuncan, Belize combining rapid systematic data collection, soil chemistry analysis, macro- and micro-artifact analysis, remote sensing, and targeted excavations. This research program has allowed us to detect subtle patterns that may reflect distinctive past practices in the plazas of Actuncan.

**Keller, Hannah (University of Colorado, Denver) and Naomi E. Cleghorn (University of Texas at Arlington)****[99]** *The Fauna of KEH-1 (South Africa) A Middle and Later Stone Age Site: A Pilot Study*

Knysna Eastern Heads Cave 1 (KEH-1) demonstrates an intense occupation sequence at a site overlooking the now sub-merged Agulhas Bank during multiple ocean progressions and regressions in the late Middle Stone Age and early Later Stone Age (46,000 to 18,000 Cal BP). The site contains numerous hearth features, densely stacked within the stratigraphic section, and has yielded large amounts of fauna. Here we report for the first time on the preliminary taphonomic analysis of the fauna, based on a sample of 1,142 specimens recovered from all major stratigraphic units. Nearly all KEH-1 faunal specimens are fragmented. Thus, an initial analytical goal was to assess the nature of this fragmentation and determine the extent to which it reflects nutrient processing rather than post depositional damage. In addition, 326 faunal specimens were chosen from throughout the stratigraphic sequence to provide a preliminary assessment of size classes represented, processing intensity, and post-depositional alteration. Our results suggest that the high rate of fragmentation is due to human processing of a wide range of prey size classes. Continued analysis of the KEH-1 fauna has the potential to elucidate the subsistence strategies of foragers in an extinct ecosystem across a critical shift in stone tool technology.

**Kellett, Lucas (University of Maine at Farmington)****[207]** *The Formation of Agro-pastoral Communities in the Chanka Heartland (Andahuaylas, Peru)*

This paper examines how Late Intermediate Period or Chanka phase (~AD 1000–1400) communities were formed during a period of overlapping social and environmental risks in the Chanka heartland of Andahuaylas. In particular, the paper considers how aggregated hilltop communities formed and functioned under new social and economic conditions. Recent archaeological research from Andahuaylas suggests that the majority of aggregated Chanka phase ridgetop sites were likely inhabited by neither specialized agriculturalists nor camelid pastoralists, but rather populations which identified as agro-pastoralists. The paper suggests that threats of attacks by neighboring populations and climate induced economic risk, may have tethered populations to smaller localized territories which encouraged more fluid socio-political-cultural identities. The author argues that hilltop communities in Andahuaylas may have witnessed a shift to a more integrated and inclusive socio-ethnic identity rooted in an agro-pastoral subsistence economy. Finally, this paper challenges an oversimplified dichotomy and social division among traditional Andean agriculturalists and pastoralists, and argues that conceptions of community and ayllu require a more nuanced and flexible understanding, especially during times of heightened risk.

**[207]** *Chair***Kelley, Alice R.****[135]** *Burning Libraries and Drowning Archives: Shell Middens on the Maine Coast*

Climate change impacts on archaeological sites are equated with the burning of the great library of Alexandria for the scale and rapidity of the loss of cultural and paleoenvironmental data (McGovern, 2016). A portion of that destruction is often in the form of sea-level rise exacerbated coastal erosion. While threatened historic sites, such as lighthouses, generate support for remediation and even relocation, coastal aboriginal sites holding records of thousands of years of coastal occupation and scientific data are damaged and disappear each year. In Maine, over 2,000 shell middens are located on the mainland and island coast. Virtually all are eroding, and some have disappeared in the decades since identification. This presentation is a progress report on our successful efforts to develop a technique to use Ground-Penetrating Radar (GPR) as a rapid, non-invasive method to delineate the areal

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and vertical extent of Maine's eroding coastal shell middens to inform cultural management decisions. Additionally, we report on the early stages of building a citizen science network to undertake rescue excavations and monitor conditions and erosion rates at sites throughout the year.

[84] *Discussant*

[84] *Chair*

Kelley, Alice R. [84] see Miller, Jacquelynn

Kellner, Corina [25] see Perez Rodriguez, Veronica

**Kelly, John (Washington University)**

[215] *Space and Place in Mississippian Societies; Lynne Goldstein's Impact on the Study of Aztalan and Cahokia Landscapes*

Lynne Goldstein's contribution to our understanding of Mississippian societies in the Midwest is still an ongoing endeavor. Her research with its roots in the greater Cahokia area and within a few years at Aztalan has an important impact on my own efforts. Her dissertation research into the Mississippian cemeteries, Schild and Moss, was methodologically rigorous and provided insights into the manner in which non-elite cemeteries some 100 km north of Cahokia were spatially and socially configured. While at the University of Wisconsin-Milwaukee Lynne began a systematic study of Aztalan and the broader landscape of the Crawfish river, one of the first efforts employing GIS in the Midwest. Her work within Aztalan examined numerous aspects relating to the site's spatial organization especially the details of a unique landscape configuration known as sculpturery. This presentation focuses not only on the context of these contributions but also the impact of her scholarship on my understanding of Cahokia's broader landscape.

Kelly, Robert L. [105] see Robinson, Erick

**Kelly, Sophia (Arizona State University), Andrew Landsman and Justin Ebersole**

[202] *Implementing the NPS Cultural Resources Climate Change Strategy at the Chesapeake and Ohio Canal National Historical Park*

As a park characterized by a man-made watercourse adjacent to a river, the Chesapeake and Ohio Canal National Historical Park is uniquely situated to address the increasing impacts of climate-related flood events on cultural resources. This analysis presents a preliminary vulnerability matrix for cultural resources on the park, which include historic structures and features, historic and prehistoric archaeological sites, and canal infrastructure. We discuss how hazards posed by flooding affect the preservation and maintenance of these resources, and suggest possible management directions to prioritize cultural resource adaptation projects with respect to the four pillars of climate change response: science, adaptation, mitigation, and communication.

Kemp, Leonard [153] see Mauldin, Raymond

**Kendell, Ashley (California State University, Chico) and Colleen Milligan (California State University, Chico)**

[179] *Resurrectionists, Criminals, and the Unclaimed: Social Context of Cadavers in the 19th Century*

Cadavers have been used to study anatomy and practice anatomical dissection for over 2,000 years. For most of this time, the use of cadavers was neither ethical, nor legal. In U.S. medical study today, most cadavers come from body donation programs largely resulting from the Uniform Anatomical Gift Act (UAGA), first proposed in 1968. The UAGA followed a change in social context of cadavers. It introduced the body as property and provided individuals the right to donate their body following death. Before the mid-1900s, the lack of legal avenues for the acquisition of cadavers led to the 18th century practice of grave robbing. In the U.S., "Resurrectionists" exhumed and sold recently buried bodies to anatomists. To stop grave robbing, anatomy acts were introduced in the late 18th/early 19th century. Governed at the state level, these laws outlined which bodies could be obtained legally for use as cadavers. Most laws allowed the bodies of criminals, suicides, indigent, or unclaimed individuals to be used as cadavers. The Point San Jose collection offers an opportunity to understand the social context of anatomy laws during the 19th century and identify those people used in anatomical studies.

Kendrick, Brianna [38] see Cromwell, Richard-Patrick

**Kennedy, Jason (Central Michigan University), Bradley Parker (University of Utah) and Matt Edwards (SWCA Environmental Consultants)**

[211] *Plow Zone Archaeology in a Wari Imperial Center*

The immense size of most Wari Imperial administrative centers has limited the breadth of our understanding of the social, political, ritual and economic activities that may have occurred within these large rectilinear compounds. In order to address these limitations, the 2017 Nasca Headwaters Archaeological Project excavation season at Incawasi attempted to apply a more traditionally North American methodology to six 50x50 meter Wari patio groups in order to draw broad conclusions about the scope of activities at the site. A total of 457 shovel test pits were excavated in a 5x5 meter grid across the site. Incawasi has been heavily damaged by modern cultivation; however, experimental studies have shown that while plowing destroys the stratigraphy at a site the vertical and horizontal movement of artifacts is limited. The implications of this for Incawasi are that shovel test pits provide an ideal methodology to create large area, low-resolution data to understand the activities undertaken within these patio groups. This paper presents the spatial analysis of the finds from the 2017 season at Incawasi in order to highlight the functional use of space in a Wari administrative compound in the Upper Nasca River Valley.

**Kennedy, Jennifer (Central Michigan University) and D. Andrew Merriwether (Binghamton University, SUNY)**

[88] *Inferences about Class Structure from Burial Form and Mitochondrial DNA Relationships at Tall Šēḥ Ḥamad, Syria*

The Roman/Parthian period (200 BCE—300 CE) at the site of Tall Šēḥ Ḥamad, Syria existed during a period in the region characterized by political instability and military movement. This "borderland," existing at the extremities of both empires, created a unique sphere of potential interactions both on the individual level and broader scale. A cemetery from this period shows four distinct burial forms (mud-brick graves, earthen graves, amphora graves and clay sarcophagi). In an effort to better understand the site of Tall Šēḥ Ḥamad this study presents thirty nine molecular profiles of individuals from the Roman/Parthian period at Tall Šēḥ Ḥamad in conjunction with archaeological mortuary evidence to determine how individuals may be related to one another, how matrilineal relationships may relate to burial form as well as potential regional interactions. Genetic results indicate a relatively homogenous population with no evidence of a recent influx of new mitochondrial haplotypes during the period under consideration despite the political disruption in the region. Genetic distances between individuals in different burial forms, however, indicate a socio-economic distinction that influenced the ways in which related individuals were buried.

**Kennedy, Sarah (University of Pittsburgh)**

[240] *Life in a Colonial Mining Camp: Reconstructing Power and Identity in a Colonial Context (Puno, Peru)*

Mineral mining was a critical driver of the Peruvian economy during the early colonial period (AD 1550—1700). Peru's mineral wealth was used to fund the Spanish empire's geopolitical domination, often at the expense of indigenous Peruvians. Many were forced to labor in distant mines and work

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camps, decimating local communities. The south-central highlands of Peru were an especially rich area for mineral exploitation and mines, work camps, and processing mills have been identified throughout the Northern Lake Titicaca Basin. Despite being a major center for colonial mining, no archaeological research to date has been conducted in the region. This poster presents preliminary mapping and surface survey data from multiple colonial silver processing sites (often called ingenios or trapiches) located 10 km southwest of Puno. These sites exhibit a variety of indigenous and Spanish architectural forms and spatial patterns. Spatial analysis techniques are applied to compare the spatial layout of domestic buildings, work zones, and communal areas at each site, noting differential levels of accessibility and visibility. Analysis reveals how social inequality, restricted and controlled access, and difficult living conditions were part of everyday social life for indigenous miners and laborers at these sites.

Kennedy, Sarah [190] see Smith, Ryan

**Kennedy Richardson, Karimah (Autry—Historic Southwest Museum—UCR)**

**[306]** *A Forensic investigation of the Ralph Glidden Human Remains Collection of the Catalina Island Museum*

Members of the Gabrielino/Tongva community always felt that the Ralph Glidden Collection within the Catalina Island museum required a forensic style of investigation. Although they may have been discussing the entire collection, it is definitely applies to the human remains collections. The Catalina Island Museum human remains collection that was recently repatriated had received limited analysis. A few scholars incorporated the collection into larger discussions about the Gabrielino and Chumash cultural communities. Decker (1970) and Wlodarski (1978), summarized aspects of Glidden's collection, but an update regarding the overall understanding about the people represented in the collection are long overdue. Many assumptions have been made about what cultures are represented in the overall Catalina Island Museum human remains Collection. This poster is an opportunity to provide a comprehensive biological profile and a comprehensive osteological analysis of the people that Ralph Glidden and others excavated, that was performed during NAGPRA and in collaborative efforts with tribal communities.

**[191]** *Discussant*

Kennett, Douglas J. [48] see Kate, Emily

Kerchusky, Sarah [165] see Vaughn, Kevin

**Kersel, Morag (DePaul University)**

**[138]** *Curatorial Cures: Storage, Partage, and the Colonial*

The crisis in the curation of materials generated as a result of excavation and survey is one of the most pressing issues facing the discipline. Storage is of constant concern as questions of how to store materials, where to store materials, and how long to store these items confront archaeologists and license/permit-granting agencies around the globe. This is an examination of an innovative approach to solving the curation crisis of Early Bronze Age ceramic vessels from the Dead Sea Plain in Jordan. After the untimely death of the excavator, thousands of pots excavated at Bab adh-Dhra' in the 1960s remained in museum storerooms, unstudied, unviewed, and unloved. Archival, collections-based, and ethnographic research revealed a scheme (devised by the Jordanian Government and representatives of the American Schools of Oriental Research [ASOR]—the excavation sponsors) to distribute the tomb groups to ASOR member institutions. Twenty-four educational institutions throughout Australia, Canada, and the United States received tomb groups for research, study, and display. This creative solution to the burgeoning storage problem in Jordan resulted in the curation of threatened collections, educational access and display of archaeological material, and "artifacts acting as ambassadors on behalf of Jordan".

**[280]** *Discussant*

**Kerwin, Ruby (Arizona State University)**

**[307]** *The Development of Hydroelectric Power over Ancestral Land in Chilean Patagonia*

Chile is largely reliant on fossil fuels for energy and is working to transition to more renewable energy sources, specifically hydroelectric power. As part of this initiative, the state is proposing the construction of five hydropower dams in southern Chile. In this paper, we analyze the potential impact of this project on the ancestral land of the Mapuche. The Mapuche have been resisting the modern Chilean state's approach to water and power and are fighting for land rights and the preservation of their culture and archaeological history. Using geographic information systems analyses we identify which areas of ancestral lands would be flooded, including threatened archaeological and historical sites. We frame the conflict between the modern state and the Mapuche with personal interviews and literature analysis.

**[307]** *Chair*

Kerwin, Ruby [307] see Lane, Rachael

**Kessler, Nicholas (University of Arizona)**

**[325]** *Carbon Legacies of Dryland Agricultural Features in the Ancient Southwest*

This paper presents the results of a meta-analysis of soil organic carbon measurements associated with pre-Columbian dryland agricultural fields in the southwestern U.S. and northwestern Mexico. In aggregate, rock alignments and terraces are associated with significantly higher organic carbon concentrations, and this effect is pronounced in sandy parent material. The results support a hypothesis that resource conserving features constructed by indigenous farmers continue to influence the ecology of drylands by enhancing plant productivity in the most water limited settings.

**Khalaf, Nadia (University of Exeter, UK)**

**[210]** *Archaeological Survey and Geographical Information Systems (GIS) in African Archaeology: Perspectives from the Niger Valley, Benin*

The Niger River Valley in the north of the Republic of Benin, West Africa, has abundant archaeology that until recently has been under researched. During a systematic field survey carried out for my doctoral research as part of the European Research Council-funded Crossroads of Empires project led by Prof Anne Haour, over 300 new archaeological sites were discovered and 50,000 material culture objects recorded. This paper will discuss the methodology used to systematically survey the landscape of this region using field walking and satellite imagery and how the results were integrated within a GIS, creating the most archaeologically comprehensive map of the area ever made. The preliminary results of this research demonstrate that settlement favoured areas close to perennial and ephemeral fluvial systems. Furthermore, the spatial distribution of the sites discovered displayed strong evidence of spatial clustering, which has been shown in other West African contexts to be indicative of early urbanisation—however this may also be evidence of the slow destruction and segmentation of mounded sites.

**Khalsa, Sant Mukh (CUNY Graduate Center)**

**[167]** *Of Fish and Plague: Death as Economic Opportunity at the Medieval Fishing Station of Gufuskálar, Iceland*

The high morbidity (50% or greater) of Iceland's Black Death in 1404 C.E. disrupted a rigidly hierarchical Icelandic social order and led to an inability to enforce social and legal constraints on Iceland's labor classes. This newly untethered and mobile lower class searched for avenues for wealth creation previously unavailable. One avenue, in the century following Iceland's Black Death, was through fishing and fish exports. During this period, previously tightly restricted fish exports flourished in trade between European merchants and numerous fishing and trading sites around Iceland's coast. The 15th

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century fishing station of Gufuskálar on the northern coast of Iceland's Snæfellsnes peninsula demonstrates large and anomalous concentrations of wealth and European trade goods. The site also has evidence of increasingly specialized marine resource utilization. Whether Gufuskálar's resident fishermen were Icelandic or European, it is likely that this concentration of wealth was only possible through the temporary breakdown in Icelandic social hierarchy. Based on the zooarchaeological and preliminary artifactual data, this paper explores how social upheaval following Iceland's Black Death is connected to intensive preindustrial fishing and a late medieval European dependence on Icelandic marine resources.

**Khatchadourian, Lori (Cornell University)****[181] Soviet Materiality and Its Ruins**

To borrow Yuri Slezkine's formulation, "the Soviet Union was an empire—in the sense of being very big, bad, asymmetrical, hierarchical, heterogeneous, and doomed". In this it differed little from the early empires that have long held archaeology's attention. But unlike its precursors, the U.S.S.R. was guided by a political ideology premised vigorously on the relationship between humans and things—between labor, the non-human inputs of production, and property. Imperial sovereignty rested on profound material dependencies that stitched the multiethnic "federation" together, while the individual Soviet subject was forged out of the proverbial hammer and sickle. As with all empires, the promised utopia never arrived, and the Marxist-Leninist "mattering" of politics came at a terrible human and environmental cost. The doom of this bold endeavor is palpable today in the physical ruins of Soviet socialism, which haunt the archaeological record of the contemporary past across Eurasia. Based on preliminary survey, ethnography, and archival research, this paper represents a foray into Soviet materiality and its afterlife, taking as its touchstone the former Soviet republic of Armenia and the industrial ruins that litter its urban and rural landscapes. What is to be done with imperial debris?

Khazraee, Emad [71] see Soroush, Mehrnoush

Khreisheh, Nada [227] see Stout, Dietrich

**Kidder, Barry (University of Kentucky), Jacob Welch (Yale University), Scott Hutson (University of Kentucky) and Shannon Plank (University of Kentucky)****[162] *Us and Them: Regional Integration and Social Differentiation during the Terminal Preclassic at Ucanha, Yucatán, Mexico***

Often overshadowed by the splendor of massive monumentality to the south, Late Preclassic life in the Northern Maya Lowlands is a period of material and social experimentation, a balancing act between emerging social differentiation and an ideology of communal integration. During the latter half of this period, the secondary site of Ucanha in Yucatán was physically integrated into a micropolity via an 18-km long sacbe and experienced the creation of integrative civic spaces, a population apogee, and an influx of ceramic heterogeneity. Unlike the more rigid and historically ingrained materialization of social differentiation seen in the Late Classic, the material components of distinction during this time were more fluid, in general, and more ambiguous during and after this process of larger regional integration. The presence of possible extrahousehold feasting at a relatively isolated, larger domestic platform, an elite residence covered in stucco with iconography indicating governance and/or economic distinction, and various ceramic forms and aesthetic embellishments highlight emerging new materialities of differentiation. With an apparent depopulation by the Early Classic, it is likely these new expressions favored social inequality over communal cohesion.

**Kidder, Tristram (Washington University) and Yijie Zhuang (Institute of Archaeology, University College, London)****[161] *The Tangled Roots of the Anthropocene: China from the Late Neolithic to the Song Dynasty***

The Anthropocene is now commonly defined as a geological event, or "golden spike" that begins in the later twentieth century with the detonation of nuclear weapons. While this event-based characterization serves a useful purpose in providing a formal geological definition, it tells us nothing of how humans developed the social, economic, technological, and moral capacities that allow us to affect natural processes at a global scale. Using archaeological and environmental data from China between the late Neolithic (ca. 5000 years ago) and the Song Dynasty (ca. 1000 years ago) we explore how the Anthropocene can be conceived as a process that developed slowly over time and that was conditioned by changing human interactions with the environment that were an outgrowth of shifting social, political and even religious practices and behaviors. This approach emphasizes that the Anthropocene is not the inevitable outcome of human technological progress but is, instead, the result of long-term transformations of human engagements with power, wealth and production.

**[336] *Discussant***

Kidder, Tristram [291] see Grooms, Seth

Kidwell, Jasmine [222] see Waggle, Tawnya

**Kieffer, C. L. (Museum of Indian Arts and Culture, University of New Mexico)****[267] *Exploring the Use of Multispectral Imaging in Ceramic Pigment Analysis***

Multispectral imaging cameras are frequently used in art conservation for identifying pigments as well as monitoring change in pigments over time. Multispectral cameras take multiple images at 370nm, 448nm, 476nm, 499nm, 519nm, 598nm, 636nm, 700nm, 735nm, 780nm, 870, and 940nm wavelengths with UV bandpass, visible bandpass, and long pass filters to increase the range of captured information to include UV reflectance and fluorescence emission images. This poster explores the ability to utilize this non-destructive technique to analyze variability of pigment recipes within ceramic types and between types. Mineral and organic black pigments from five Black-on-white ceramic types (Jemez, Cortex, Chuska, Red Mesa, and Abiquiu) from the American Southwest were used for comparative purposes. Pigment and reflectance values acquired from images via Image J software were compared both within types and between types with one-way ANOVA analysis. Results show varying levels of significant statistical difference between types and minimal difference within types.

Kieffer, C. L. [15] see Crews, Christopher

**Kienon-Kabore, Timpoko Héléne (University of Félix Houphouët-Boigny of Cocody) and Vincent Serneels (University of Fribourg)****[32] *La Metallurgie Ancienne du Fer de la Zone 4000 de Siola (Kaniasso, Zone d'Odiéne, Nord-ouest de la Côte D'Ivoire)***

Près de Kaniasso dans la zone d'Odiéne, sur les sites de Siola, zones 1000 et 2000, et Doumbala, une séquence chrono-technologique en trois phases a été mise en évidence, caractérisées par trois traditions techniques différentes: KAN 1 (1300—1450 AD), KAN 2 (1450—1650 AD) et KAN 3 (1650—1900 AD). Des vestiges présentant de grandes similitudes ont été identifiés sur de nombreux sites dans la région.

Par contre, le site de la zone 4000 de Siola, dont l'étude sur le terrain a été reprise en 2015, présente un faciès complètement différent, la tradition technique KAN 4. Le site occupe une superficie de l'ordre de 2 km<sup>2</sup> et comporte environ 200 amas de scories, des enclos et des murets. On note aussi la présence d'un abondant mobilier domestique. L'organisation spatiale des amas de scories, l'architecture des fourneaux en fosse complètement ensevelis sous terre et la nature des déchets métallurgiques, se distinguent clairement des vestiges reconnus ailleurs. Les tuyères présentent de curieuses perforations latérales, une particularité inconnue par ailleurs.



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Mots clés : Côte d'Ivoire—Métallurgie du fer—Fourneaux—Amas de scories.

**Kilby, David (Texas State University) and Marcus Hamilton**

**[127]** *New Investigations at Bonfire Shelter: A Consideration of Bison Jumps and Their Implications for Paleoindian Social Organization*  
Bonfire Shelter (41VV218) is a nationally significant site in the Lower Pecos region of the West Texas borderlands that preserves evidence of what may be the oldest and southernmost "bison jump" in North America. At least two major episodes of bison hunting are evident at Bonfire Shelter, one associated with Paleoindian Plainview and Folsom projectile points, and another associated with Late Archaic Castroville and Montell points. The approximately 12,000-year-old layers comprising Bonebed 2 appear to represent a singular example of this hunting technique in these early time periods, and are the subject of recent debate. There is disagreement as to whether one or as many as three hunting events are represented in Bonebed 2, and as to whether or not they truly represent bison jumps. This paper reports the results of renewed field investigations into the timing, context, and cultural associations of both bone beds at Bonfire Shelter carried out by the Ancient Southwest Texas Project at Texas State University.

The paper then considers the interpretation of these archaeofaunal deposits as bison jumps, and the implications of those interpretations for Late Pleistocene hunter-gatherer social organization in the Lower Pecos and the larger Southern Plains region.

**Kilgore, Gertrude (Texas Tech University), Claire Novotny (Kenyon College) and Alyssa Farmer (University of Kentucky)**

**[157]** *Domestic Activity Areas in a Late Classic Residential Courtyard Group at Chan Chich, Belize*  
Households represent a foundational element of any society. The everyday activities that occur within domestic spaces construct and reinforce the social, economic, and political framework upon which societies are built. The 2017 field season of the Chan Chich Archaeological Project saw the first explicit study of domesticity and everyday life at the ancient Maya site of Chan Chich with investigations of final phase domestic activity areas in Courtyard D-4. This Late Classic residential group consisted of three structures centered around a shared courtyard space approximately 550 m east of the Main Plaza. We analyzed the use of structural, courtyard, and extramural spaces by using multiple lines of evidence from multi-elemental analysis of plaster samples and artifactual and architectural data. Analyzing these categories of evidence associated with three different contexts allowed us to reconstruct domestic activity areas at different phases of everyday life: the production, consumption, and disposal of household objects. This research contributes some of the first information about the functional and sociocultural relationship between domestic spaces, activities, and individuals at Chan Chich.

Killebrew, Ann [90] see Greenfield, Haskel

**Killgrove, Kristina (University of West Florida)**

**[61]** *Discussant*

Killick, David [242] see Stephens, Jay

**Killion, Thomas (Wayne State University)**

**[254]** *Gardens, Infields and Outfields: Cultivation Intensity, Neotropical Landscapes and the Evolution of Early Agricultural Systems*  
Plant cultivation in and around residential locations and at greater distances from settlements are options early cultivators employed, supplemented by wild resources, to meet subsistence needs. The mix of plants, soils and cultivation practices varied by environment, distribution of resources, population density and other factors. This paper examines the role of gardens over the long transition from hunting and gathering to agriculture in tropical lowland environments. Ethnographic data, derived from a sample of neotropical contexts, are used to evaluate some of the earliest evidence (micro- and macrobotanical, isotopic and archaeological) for maize and other crops in lowland Mesoamerica.

**Kim, Lynn (University of Texas at San Antonio) and Andrea Goytia (Universidad San Andres Bolivia)**

**[132]** *A Colonial Space in the Camata-Carijana Valley: A Review of the Tambo, Maukallajta*  
The Camata-Carijana Valley is situated on the eastern frontier of the Inka Empire in the Kallawayaya domain. Ethnohistorical accounts state the valley was occupied by the Kallawayaya and Chuncho groups from the tropical piedmont (Saignes 1984, 1985; Steward 1948). Therefore, the Camata-Carijana Valley offers the opportunity to study Inka, Kallawayaya, and Chuncho entanglements through time. This paper focuses on the site of, Maukallajta, in the Camata-Carijana Valley. Also known as Pueblo Viejo, Maukallajta was an Inka tambo. It was likely established to promote trade with other groups (Alconini 2012; Capriles Flores and Herrero 2006). More specifically, the research explores how the impact of Inka imperialism affected the architectural patterns of Maukallajta. Therefore, the location, organization, and architecture of Maukallajta will be analyzed to understand its nature and purpose (Moore 1992, 2011; Pozorski and Moore 1997). Terraces and roads associated with the site will also be examined. Maukallajta is just one colonial space in the Camata-Carijana landscape in eastern Bolivia. Other settlements, pre-Hispanic roads, and agrarian terraces are discussed to provide a regional perspective and to explore the relative impact of Inka imperial processes in the Camata-Carijana Valley.

**Kim, Yong Jun (Seoul National University College of Medicine, Seoul, South Korea), Nilesh Jadhav (Dept. of Archaeology, Deccan College PGRI, Pune, In), Eun Jin Woo (Dept. of Oral Biology, Yonsei Univ, Seoul, South Korea), Dong Hoon Shin (Seoul National University College of Medicine) and Vasant Shinde (Dept. of Archaeology, Deccan College PGRI, Pune, In)**

**[56]** *Harappan Necropolis of Rakhigarhi, India: Archaeology and Bioanthropology*  
The number of Harappan cemeteries so far systematically surveyed is far less than that of contemporary settlements. Necropolis site at Rakhigarhi (India) was reported earlier but in small scale investigation. Our investigation for the last three seasons (2013 to 2016) was thus designed for improving this lacuna. We first classified each burial and analyzed statistically. The Harappan people practiced rather humble burial custom, but few were found differently and these burials look more socio-economically affordable than those found in typical burials. The health condition during life-time of the buried looks healthy according to bioanthropological investigation. Prone positioned burial is interesting since it was not as deviant cases. Rather, they would have held relatively higher social and ritual position in Rakhigarhi society according to anthropological and archaeological context. Collaborative work was designed for better investigation on the Harappan people's life and mortuary customs. We applied to systematic osteoarchaeological field methods, bioanthropological lab-analysis and other innovative methods. This research was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2017R1D1A1B03030127) and National Geographic Foundation for Science and Exploration—Asia (Asia-21–15). Please contact DHS (cuteminjae@gmail.com) or VS (vshinde.dc@gmail.com) for any questions.

Kimball, Michael [29] see Brunswig, Robert

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**King, Adam (SC Institute of Archaeology and Anthropology), Terry Powis (Kennesaw State University), Jaime Awe (Northern Arizona University), Gyles Iannone (Trent University) and Nilesh Gaikwad (University of California at Davis)**

**[256]** *Tripping through the Underworld: Exploring Maya Ritual through Absorbed Residues in the Belize Valley*

While absorbed residues are widely used to explore subsistence-related questions, more recent work has used them to examine the use of elite and ritual beverages. In this paper, we explore absorbed residues found in ceramic containers and bone tubes recovered from caves, burials, and caches in the Belize Valley. The ceramic vessels presumably held liquids consumed or otherwise used in rituals in these settings, while the bone tubes delivered substances to participants in those rituals as enemas. Results of our analyses shed light on the kinds of substances used by the Classic Maya in their rituals associated with the underworld.

**King, Allison**

**[331]** *Living History in the Classroom: An Assessment of an Alternative Teaching Program*

This project was an assessment of the "Pioneers in Texas" structured historical program aimed at evaluating the effects of a Living History program on the participating students in an effort to expand the use of Living History pedagogy in standard curriculum. The program is conducted at the 1830s Jones Stock Farm at the George Ranch Historical Park (Park) in Richmond, Texas. The activity consists of lecture and participatory activities in the pioneer life experienced by one family of Austin's Old Three Hundred. The Park was interested in expanding an existing teacher-fed assessment to include students and their experiences; including, how the students recognized the Jones family as a real family, and not a historical construct. The Park wanted to assess how the program was effective in conveying history from the perspective of the Jones family and how this impacted the students. This assessment was completed collectively through a pre-project participation, observation, and group interviews.

**King, Charlotte (University of Otago), Sian Halcrow (University of Otago), Andrew Millard (Durham University), Vivien Standen (Universidad de Tarapacá) and Bernardo Arriaza (Universidad de Tarapacá)**

**[87]** *Interpreting Increments—What Can Isotopic Evidence Tell Us about Care in the Past?*

Maternal and infant care practices are deeply individual, as well as being affected by both cultural and environmental factors. Disentangling the various processes which lead to decision-making in the past is difficult, and bioarchaeologists must use multiple lines of evidence to begin to understand behaviours. New incremental isotopic techniques mean that it is now possible to look at individual maternal and infant experiences through tissue chemistry. However, incremental isotopic results are equifinal meaning that multiple interpretations of the data are often possible. This talk will focus on a group (n=5) of incremental isotopic profiles from infants and children from the Inka period site of Camarones 9 in northern Chile. Using these profiles, we will explore how knowledge of the archaeological context, biological factors which may affect isotopic values and consideration of sociocultural theory may allow better interpretation of results. In doing so, we highlight the different maternal and infant experiences seen in individuals from the same archaeological period, and the importance of the individual in archaeology.

**King, Eleanor (Howard University)**

**[233]** *Moderator*

King, Jason [66] see Fletcher, Brittany

**King, Julia**

**[138]** *Wonderful Things: Using Legacy Archaeological Collections for Research*

How does one go about using legacy archaeological collections—or any archaeological collection, for that matter—for research? The prospect can be daunting, especially if you are staring down dozens of dusty boxes on shelves. This paper offers direction for studying even the most untamed collection by understanding it as a type of secondary data—lessons learned while working with legacy collections from the Potomac and Rappahannock river valleys in Maryland and Virginia. Secondary data, a term that crosses disciplines, is, in the broadest sense, data collected by someone else and used to address new or different questions than those originally posed. Defining research questions, becoming familiar with a collection, creating checklists, reconstructing provenience, developing methods for sorting, coding, and re-coding collections data, and applying appropriate quantitative techniques are steps we identified and found useful for the study of older collections, some generated nearly 80 years ago.

**King, Robert (Bureau of Land Management)**

**[261]** *Implementing NAGPRA: A Look at BLM's Experiences in Alaska, 1990–2017*

The 1990 passage of the Native American Graves Protection and Repatriation Act (NAGPRA) resulted in new responsibilities and challenges for the Bureau of Land Management (BLM). These included working with museums and tribes concerning certain items in museums removed from federal land sometimes more than a century earlier. The BLM in Alaska has been actively involved with NAGPRA work since the early 1990s, and has completed numerous Federal Register Notices and repatriations with more in progress. This paper briefly looks at some of the unexpected issues and situations that have occurred over the years along with many successes.

**King, Stacie (Indiana University)**

**[275]** *Cultural Pluralism and Persistence in the Colonial Sierra Sur of Oaxaca, Mexico: Three Case Studies*

This paper explores the interactions between multiple groups of people in the Sierra Sur region of Nejapa and Tavela, Oaxaca in trans-conquest and Colonial Mexico. Bringing together ethnohistoric accounts, oral histories, and archaeological data in Nejapa and Tavela, I highlight three case studies to show that migration, conquest, and interregional trade created a complex, dynamic, pluralistic ethnic landscape prior to the arrival of the Spanish. As such, when the Spanish colonial regime took hold in the Sierra Sur, people in Nejapa and Tavela were already accustomed to making strategic choices about how to engage. Some distanced themselves from migrants, merchants, and militaries, while others embraced new opportunities for trade and exchange. Some used the Spanish legal system to protect or solidify their social and political standing, while others persisted in maintaining subversive and secret indigenous religious practices and spaces. Enslaved Africans, government officials, priests, and residents of various castas likewise struggled to find their places. Understanding the dynamics of the pluralistic cultural landscape of Colonial Nejapa requires bringing together various threads of evidence and accepting that identities in Nejapa were, and always had been, multiple, changing, and global, across time and space, before, during, and after Spanish colonialism.

**[321]** *Discussant*

**Kingrey, Haden, Matthew Napolitano (University of Oregon), Geoffrey Clark (University of Oregon) and Scott Fitzpatrick (University of Oregon)**

**[13]** *Exploring Manufacturing Variability in Calcareous Sand Tempered Pottery on Yap, Western Caroline Islands*

The oldest identified sites on Yap are identified by presence calcareous sand tempered (CST) pottery from deeply stratified deposits. With few exceptions, CST pottery, made from locally produced clay, has been recovered from Runglu and Pemrang, two sites in southern Yap, western Micronesia (northwest tropical Pacific). Although poor preservation conditions and small sample sizes make it difficult to reconstruct vessel size,

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detailed analysis of sherds demonstrates at least two sub-types. Recent excavations at Pemrang have yielded the largest sample of CST pottery ever recovered and allow for inter- and intra-site comparison. Results will help us understand the poorly understood early settlement of Yap.

**Kinsman, James and David Asher (Armagh Observatory & Planetarium, College Hill)**

[33] *Evidence of Meteor Shower Outbursts Recorded in the Classic Maya Hieroglyphic Script Using Orbital Integrations*

No firm evidence has existed that the ancient Maya civilization recorded specific occurrences of meteor showers or outbursts in the corpus of Maya hieroglyphic inscriptions. In fact, there has been no evidence of any prehispanic civilization in the Western Hemisphere recording any observations of any meteor showers on any specific dates. The authors numerically integrated meteoroid-sized particles released by Comet Halley as early as 1404 BC to identify years within the Maya Classic Period, AD 250–909, when Eta Aquariid outbursts might have occurred. Outbursts determined by computer model were then compared to specific events in the Maya record to see if any correlation existed between the date of the event and the date of the outburst. The model was validated by successfully explaining several outbursts around the same epoch in the Chinese record. Some outbursts likely observed by the Maya were due to recent revolutions of Comet Halley, within a few centuries, and some to resonant behavior in older Halley trails, of the order of a thousand years. Resonant behavior from both Jupiter and Saturn controlled dynamical evolution of meteoroids in apparently observed outbursts.

**Kintigh, Keith (Arizona State University) and Jeffrey Altschul (Statistical Research, Inc.; SRI Foundation)**

[247] *Convergence Research and the Coalition for Archaeological Synthesis*

Archaeological forays into the climate change debate have generally been through case studies that integrate archaeological, anthropological, and paleoenvironmental data into coherent, evidence-based narratives that document how cultural systems in a relatively small geographic region adapted to long-term climatic change. While these cautionary tales can play a valuable role in galvanizing public opinion, they generally have not influenced public policy. What is lacking are scalable inferences relating long-term cultural resilience and sustainability to social configurations and strategies for addressing environmental dynamics. Achieving these inferences demands that we move beyond case studies and leverage the vast amount of archaeological data captured in heritage studies in what the National Science Foundation has characterized as convergence research, “the deep integration of knowledge, techniques, and expertise from multiple fields to form new and expanded frameworks for addressing scientific and societal challenges and opportunities.” The Coalition for Archaeological Synthesis was formed to foster and support precisely this type of collaborative synthetic research. This paper describes how, through such research, the Coalition has the potential to transform archaeological practice and to allow our results to be incorporated in public debates and policy initiatives on subjects such as climate change.

[279] *Moderator*

**Kirakosian, Katie V. (UMass Amherst)**

[313] *Planting a Seed and Watching It Grow: Planning an Open Textbook from Scratch*

This paper outlines how this open textbook moved from an idea to a reality over the past year. As a non-traditional project in archaeology, the infrastructure for such a project had to largely be framed from scratch, including a social media and marketing campaign as well as a process for co-authoring and reviewing chapters. Although the textbook is not yet completed, lessons learned along the way will be offered with the hope that sharing our model will inspire more open textbooks in our field.

[280] *Moderator*

[149] *Discussant*

**Kirk, Scott and Michael J. Kolb (Metropolitan State University of Denver)**

[23] *A Mosque and a Castle: The Discovery of the Salemi Mosque*

In the summer of 2007 an elaborate, colonnaded gypsum-plaster floor was discovered outside of the Salemi Castle in western Sicily. Believed to date sometime between the 10th and 12th centuries, this feature was constructed during a period when the island of Sicily was repeatedly invaded and conquered by a series of expanding political entities. As such, interpretation of this feature has proved to be somewhat difficult. However, its orientation in an eastward direction may suggest that this structure was used as a mosque, possibly associated with an Islamic hilltop fortification similar to the hisn of medieval Iberia. In this presentation, we discuss both architectural and spatial evidence that suggests this find is comparable to other identified mosques found around the Mediterranean, and particularly those found across Sicily.

Kirk, Scott [85] see Balco, William

**Kirker, Jennifer (Pick Museum, Northern Illinois University)**

[163] *Outside Looking In: The Piedras Negras Near Periphery Re-examined*

Surveys in 1997 and 1998 recorded 89 Classic Maya sites with 254 structures in the near periphery of Piedras Negras, Guatemala. Twenty-five sites were test pitted and five were intensively excavated. Recent re-analysis of the ceramic, lithic and architectural data from these sites provides new insights into how the Late Classic Maya (A.D. 625–825) in the near periphery participated in the Piedras Negras kingdom. Population size and implications for conflict are considered. Comparison of material evidence from the center with the near periphery sites suggests how identity and agency might have been negotiated at Piedras Negras during its most volatile and dynamic period of growth, warfare and collapse.

**Kirkley, Samantha (Utah Project Archaeology)**

[168] *Connecting Project Archaeology and Girl Scouts Camps for Community-Based Learning Experiences at Ancestral Puebloan Sites in Utah*  
Project Archaeology is an educational organization dedicated to teaching scientific and historical inquiry, cultural understanding, and the importance of protecting our nation's rich cultural resources. It is a network that makes archaeology education accessible to students and teachers nationwide through high-quality educational materials and professional development. Built on the Understanding by Design curriculum model, Project Archaeology: Investigating Shelter is a complete archaeological investigation curriculum and is endorsed by the National Council for the Social Studies. In recent years, this curriculum has been adapted to use in informal settings, such as Girl Scouts camps. Scouts had the opportunity to learn about the past through visiting Ancestral Puebloan sites and engaging with Elders from the White Mesa Ute Tribe and the Navajo Nation. Based on mini-assessments and verbal feedback, these experiential learning opportunities coupled with a powerful curriculum have been life changing for many. However, to more clearly show that our efforts have made a difference, Pre- and Post- assessments will be implemented to obtain quantitative and qualitative data that will improve programming and ensure that enduring understanding is taking place.

Kishimoto, Takumi [24] see Sweeney, Alex

**Kissel, Marc (Appalachian State University)**

[329] *Can We Talk about Modern Human Behavior in non-Homo sapiens?*

Discerning what makes *Homo sapiens* distinctive among the rest of the species on the planet has been a difficult task. One suggestion has been our use of symbolic culture, the use and transmission of symbols intergenerationally. There is much discussion, however, about who the first ‘symbol users’

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were, partly due to debates as to what actually makes something 'symbolic.' In this paper, I discuss how anthropologists first came to use symbol as the sine qua non of modern human behavior. Then, using archaeological and fossil data from the Old World, I show that many of the behaviors that are often suggested to be the sole purview of *Homo sapiens* have their genesis in the more remote past. Drawing from semiotic theory and the extended evolutionary synthesis, I argue that applying a more integrative theoretical framework can allow paleoanthropologists to discuss the behavior of our hominin ancestors without assuming too much or too little about their 'humanness.'

[329] Chair

**Kistler, Logan (Smithsonian Institution), Saiful Islam (Drik, Bangladesh), Mark Nesbitt (Kew Royal Botanical Garden), Roselyn Ware (University of Warwick) and Robin Allaby (University of Warwick)**

[143] *The Search to Resurrect Muslin Cotton in Bangladesh*

Bengal cotton muslin, a particularly fine type of woven cotton fabric, had legendary status where it was traditionally produced in East Bengal—now Bangladesh—for at least 2000 years. During the colonial influence of the British Empire, muslin was widely traded outside of South Asia, and became a valuable global commodity with major impacts on both local producers and foreign markets. Political turmoil and market forces, especially pressure from the East India Company, completely halted muslin manufacture in the early 20th century. As a result, "Phuti Karpas"—the variety of cotton required for its production owing to particular fiber characteristics, botanically *Gossypium arboreum* var. *neglecta*—was entirely lost. An extensive search was undertaken to locate any living example of *neglecta* in crop fields or in the wild, and a candidate wild population was identified. With only 100–250 year old herbarium specimens available for comparative materials, we use whole genome sequencing of modern and herbarium specimens to suggest that a wild-type Phuti Karpas has indeed been rediscovered. We describe molecular and morphometric results, as well as ongoing efforts to cultivate *neglecta* and revive traditional practices for muslin weaving.

**Kitchel, Nathaniel (University of Wyoming) and Heather Rockwell (University of Wyoming)**

[77] *Paleoindian Archaeology in the Munsungun Lake Region: Beyond Norway Bluff*

In the late seventies and early eighties Robson Bonnicksen identified and tested several fluted point occupation loci adjacent to chert deposits on Norway Bluff, Piscataquis County, Maine. Since that time various research projects have demonstrated the importance of chert from this region to the lithic economy of fluted point groups in northeastern North America. Despite these new insights little archaeological research has taken place in the Munsungun Lake region since Bonnicksen's original study. Here we present the results of our fieldwork from the summers of 2016 and 2017 that revealed the presence of additional lithic quarries in this location, as well as several potential fluted point sites associated with these newly identified quarry outcrops. These finds further demonstrate the importance of chert from the Munsungun Lake formation to the lithic economy of prehistoric groups in the region.

**Klarich, Elizabeth (Smith College) and Laure Dussubieux (Field Museum of Natural History)**

[141] *Making and Moving Pottery in the Northern Lake Titicaca Basin, Peru*

Pukara, in the northern Lake Titicaca Basin, was a regional center during the Late Formative Period (200 BC- AD 200). The Classic Pukara style is associated with monumental public constructions and sunken temples, elaborate stone sculpture, and a unique polychrome pottery tradition. Spotted felines, disembodied heads, camelids and plants, and anthropomorphic figures were incised and painted on incense burners, trumpets, and other special purpose ceramic vessels that were circulated in the Titicaca Basin and to neighboring regions. While there is limited direct evidence of ceramic production at Pukara, previous researchers have inferred centralized fineware production based on standardization measures such as size, shape, paste, and surface finish recorded from various collections. To further explore the nature of crafting practices during the Late Formative at Pukara, compositional analysis using LA-ICP-MS was recently completed of 150 samples, including clays collected near Pucará town and archaeological ceramics excavated from Pukara. We present the results of these analyses, which are used to address functional, chronological, and spatial variability in the production, circulation and consumption of Pukara utilitarian and ritual vessels during the Late Formative period.

**Klassen, Sarah (Arizona State University)**

[175] *The Adaptive Capacity of the Water Management System of Angkor, Cambodia*

This paper assesses the relationship between elements of adaptive capacity of a water management system among six time periods. The archaeological case study, Angkor, Cambodia, was the center of the Khmer Empire for over 600 years (9th-15th centuries CE). During this time, the Khmers developed one of the largest and most complex water management systems in the pre-industrial world. In this paper, I use geographic information system analyses to quantitatively and qualitatively assess six elements of adaptive capacity (the amount of water harnessed by the system, investments in infrastructure, human capital, redundancy, equal distribution of resources, and innovation) for six time periods. The relationships and trade-offs among the six elements shed light on agricultural production at Angkor as well as general theory on what elements contribute to the resilience of water management systems.

[175] Chair

Klassen, Sarah [307] see Kerwin, Ruby

Klaus, Haagen [65] see Shimada, Izumi

**Klaus, Haagen (George Mason University)**

[117] *Alterity, Resistance, and Autonomy: Mortuary Archaeology and the Diversity of Indigenous Responses to Spanish Conquest in Lambayeque, Peru*

Over the last few decades, archaeological narratives have shifted towards far more nuanced understandings of colonized peoples in favor of reconstructing nuanced and integrated understandings of indigenous perception, identity, biosocial interplays, and other responses to conquest. This work merges archaeological, ecological, and bioarchaeological contexts to help understand the significance of mortuary pattern data to compare postcontact cultural outcomes in Mórrope and Eten, two contemporaneous north coast Peruvian communities inhabited by native Muchik peoples (circa late A.D. 1530s—1750). In Mórrope, a biological disaster unfolded as the survivors of conquest created a resistance-driven hybrid Andean-Iberian culture. In Eten, microenvironment and a prosperous economy buffered against similar biological experiences as local peoples became thoroughly acculturated into the Spanish sphere. These outcomes are interpreted within a multi-scalar framework of alterity to explore how this diversity reflected diverse community strategies, engagements, and perceptions of "the other" in the negotiation of indigenous agendas and identities while enduring colonial subjugation.

**Klehm, Carla (Washington University—St. Louis)**

[210] *From Geophysics to Building a Predictive GIS Model of Archaeological Sites in the African Interior: Spatial Archaeometric Applications of the Bosutswe Landscapes Regional Survey, Botswana*

Expanding trade in gold and ivory in the first millennium linked sub-Saharan Africa to the Middle East and Asia through maritime and land-based exchange. This Indian Ocean trade supported the flow of exotic goods and ideas into the interior of southern Africa, where polities developed by the

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mid-13th century. The African experience has often focused on larger cities and coastal societies, or framed through viewpoints of those beyond the continent. In particular, landscape approaches, especially in the interior, have been few, particularly ones that integrate spatial archaeometric techniques.

Since 2014, Bosutswe Landscapes (BosLand) has combined geophysical, drone, and satellite remote sensing with traditional pedestrian survey and excavations to approach the local landscapes. This presentation introduces the BosLand project, especially our 2017 geospatial research. 2500 km<sup>2</sup> of multispectral imagery was used to locate several dozen archaeological sites around Bosutswe, most of which were previously unknown. The paper will provide an overview of the project, the decision-making process involved in obtaining imagery, the general approach used for identifying sites and the

predictive model, and early implications: practical logistics useful to Africanists interested in more fully integrating remote sensing into projects, especially those working in austere environments facing limited technological field resources.

[210] *Chair*

Klehm, Carla [286] see Follett, Forrest

Kleihege, Christopher [46] see Sagripanti, Jose-Luis

### Klein, Cecelia

[209] *Of Eye Rings and Torches: The Fire Priests of Chichen Itza and Their Legacy in Aztec Tenochtitlan*

A number of enigmatic human figures in the imagery of late 9th-early 10th century A.D. Chichen Itza can be identified as fire priests, men whose task was to drill, tend, and/or oversee ritual fires reenacting the primordial birth of the sun from a flaming hearth at ancient Teotihuacan. Detailed analysis of the costumes, ceremonial responsibilities, and internal rankings of Chichen's Itza's fire priests reveals strong similarities to those of later Aztec fire priests as documented in painted manuscripts, stone carvings, and early colonial writings. These men, like the fire priests of Chichen Itza, dressed as the god known to the Aztecs as Tlaloc, who was the divine patron of the branch of the Aztec priesthood responsible for fire rituals. Although interesting iconographic parallels also appear at late 9th- early 10th c. Tula, whose legacy in Tenochtitlan is well documented, the Aztec priests' physical and structural similarities to Chichen Itza are more numerous and more compelling. This suggests that the Aztecs, by some means still undetermined, were directly or indirectly drawing upon information and/or memories passed down to central Mexico from Chichen Itza.

### Klembara, Nathan

[220] *In and "Out" of the Cave: Queerness on the Upper Paleolithic Funerary Landscape*

Amongst many other facets of human life, the practice of burying the dead demarcates and changes a space, it becomes imbued and entwined with the identity of the deceased. The physical act of placing a body into the ground is a place-making practice, a performative act, and, in the process, the place becomes gendered. This has been true since the origins of burial practices in the human lineage, dating to at least the early Upper Paleolithic, and perhaps earlier. This paper is a preliminary attempt to look back at the European Upper Paleolithic burial record to examine these burials as queer spaces, and as a place for queer identity construction, reconstruction, and negotiation. The Upper Paleolithic has a severely limited number of burials, and thus these burial places—both cave or rockshelter and open-air contexts—and the individuals contained within them, can be considered queer, different, and non-normative. The queer nature of the embodied identities of these burials and their location has been hereto unexplored. Through an analysis of the intersection of bodies, grave goods, landscapes, and queer theory, the fluidity and contextuality of Upper Paleolithic gendered and sexual spaces and identities will emerge.

### Klemmer, Amy (University of Wisconsin-Milwaukee)

[7] *Zooarchaeological Analysis of Fishing Strategies at Rio Chico, Ecuador (OMJPLP-170)*

The Rio Chico site was occupied almost continuously for 5000 years (ca. 3500 B.C.E. to 1532 C.E.) in a region of coastal South America that is heavily influenced by climatic events such as El Niño Southern Oscillation (ENSO). Evidence suggests that occupants of Rio Chico were heavily dependent on marine resources. The fishing strategies utilized at Rio Chico sustained the community over time, which allowed for the long-term development of an economy based on the *Spondylus* trade. This combination of climatic volatility, dependence on ocean resources, and occupation history provides an opportunity to study coastal resource usage over a long temporal span. This poster presents the results of a zooarchaeological analysis of a sample of faunal remains from the Florida Atlantic University (FAU) field school excavations conducted in 1997, 1998, 1999 and 2003. All remains were identified to the class level and a subset of this sample was identified to the family level. These identifications serve as the basis of this analysis. This analysis provides a foundation for further research to compare a coastal and an inland site in Ecuador, which will contribute to an understanding of the relationship between coastal and inland sites during times of environmental stress.

### Klingelhofer, Eric

[51] *Assessing Threats to Coastal Sites: A Trial Run on St Croix, USVI*

The International Association for Caribbean Archaeology's Endangered Sites Task Force is concerned about the threat to coastal sites by rising sea levels. In March 2017, a small team of Mercer University non-archaeology students participated in a project on St Croix, USVI, to determine how local populations could best provide measurable information to professional archaeologists and cultural resource managers. The five-day project assessed ten sites assigned by the USVI Territorial Archaeologist. Through trial and error, the resulting 'Mercer Method' of data collection proved that using available smartphones and GPS proved much more effective than traditional survey procedures.

Klippel, Alexander [101] see Huang, Jiawei

### Klokler, Daniela (Universidade Federal de Sergipe—UFS) and Fernando Almeida (Universidade Federal de Sergipe—UFS)

[70] *Valley of No Masters: Exchanging Experiences at the Valley of the Masters, Northeastern Brazil*

Field schools, and Methods and techniques in Archaeology classes are mandatory steps to achieve Master's or a PhD degree in most graduate programs in Brazil. We, as instructors noticed a certain mismatch in students' behavior in regard to decision-making in both situations: reticence during field activities, boldness during class discussions and debates. This dichotomy seemed to be related to field experiences in which the students had fewer opportunities to engage with other "more experienced-professional" archaeologists to make decisions. Inspired by calls for a more inclusive fieldwork experience we developed a proposal (tested in 2016 and 2017) in which students were collectively in charge of all decisions. We then encouraged debates and deliberations before any final determinations, and took the occasions to present distinct alternatives of action. The experience of continuous justification of decision making, of taking such decisions in a context with no hierarchy, and later the critical evaluation of the results obtained, turned out a considerable challenge for the students. In this paper we present the results—both archaeological and educational—of this innovative approach, and ideas we intend to implement in the future.

Klotsko, Shannon [79] see Davis, Loren

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Klugh, Elgin [251] see Castanzo, Ronald

**Knaf, Alice (Vrije Universiteit Amsterdam), Joanna Ostapkowicz (University of Oxford) and Gareth Davies (Vrije Universiteit Amsterdam)**

**[139]** *SIBA: The Research Potential of Bahamian/TCI Museum Collections*

Project SIBA (Stone Interchanges in the Bahamas Archipelago) brings together the largest corpus of Bahamian/TCI stone artefacts ever assembled—over 300 artefacts from eight international museums, including the Smithsonian's National Museum of the American Indian and the National Museum of Natural History. In an entirely limestone environment like the Bahamas/TCI, all hard stone had to be imported: our objective is to determine the source of these exotics. Integrating studies that combine the arts with state-of-the-art minimal-invasive laser ablation sampling for isotope studies, we aim to explore the wider social, political and economic connections between the archipelago and its wider Caribbean setting. The selected artefacts, including celts and anthropo/zoomorphic carvings, have well-documented collection histories, forming an exceptionally rich corpus for investigating materials and meanings. Museum collections offer a unique opportunity to study artefacts that are now rarely encountered in the archaeological record: in the Bahamas, such artefacts were mainly deposited in caves that were largely cleared for the guano-rich soils in the 19th century. Museum collections are therefore an integral component when looking at the wider archaeological context for these islands: without them, we lose connection to a large and important body of material that had clear value and meaning.

**Knappett, Carl (University of Toronto)**

**[83]** *Discussant*

**Knell, Edward (California State University, Fullerton)**

**[21]** *The Late Paleoindian Cody Complex Component at Lamb Spring, Colorado*

The Late Paleoindian Cody complex component at Lamb Spring, Colorado was recently reanalyzed. While best known for its possible association with Late Pleistocene fauna, the Lamb Spring Cody component with its nearly 2,000 bison bones, seven Eden projectile points, Cody knife fragment, and two flakes has largely been overlooked and incompletely described in the literature (excepting McCartney's study of the bison bones). To remedy the situation I: (1) use prior publications, reports and the original field notes to describe and interpret the component, (2) describe the recently analyzed chipped stone assemblage, and (3) compare Lamb Spring to other Cody complex sites in the region. The Cody component is in a paleo-stream channel that directly overlies the Late Pleistocene fauna, and has two spatially discrete levels separated by 4–5 cm of sediment. The occupation levels vary in projectile point technology and raw material preference. Though made from locally available lithic materials, the tool assemblage is fragmented and heavily resharpened. The projectile points are atypical in their lack of a dominant parallel collateral flaking pattern. Two (or more) small groups of Cody hunters used a stream channel to trap, kill and process some 27 bison between the late fall/early winter and mid-spring.

Knierim, Rebekka [183] see Dice, Michael

**Knight, Charles (University of Vermont)**

**[31]** *Ceramics, Ground Stone and Miscellanea at the Zaragoza-Oyameles Obsidian Quarry in Puebla, Mexico*

One result of the intensive, 5-m interval surface survey of the Zaragoza-Oyameles obsidian source area in Puebla, Mexico was the recovery of several artifact classes suggestive of prolonged habitation. Ceramic and ground stone artifacts recovered indicate that domestic activities were an important component of the obsidian procurement and production economy. Ceramics tended to concentrate in areas that also contained higher quantities of ground stone, but did not correlate with any one stage of obsidian reduction. The majority of identifiable ceramic vessels were ollas and cajetes, suggestive of domestic activities. Manos and metates were the most common ground stone artifacts recovered, although molcajetes, axes, and formal, worked hammerstones also were recovered. Manos and metates exhibited considerable variation in size and shape. When these indicators of domestic habitation are correlated to the obsidian surface data, patterns of domestic crafting at different intensities across space can be observed.

**[285]** *Discussant*

**Knight, Vernon (University of Alabama)**

**[139]** *Communities of Practice and Sequencing from Older Caribbean Collections in the NMAI and NMNH*

The Caribbean holdings of the National Museum of the American Indian and the Anthropology Department of the National Museum of Natural History contain material from historically important early excavations like those of M. R. Harrington in eastern Cuba in 1915 and Herbert W. Krieger in the Dominican Republic in 1928. Moreover, they include the results of early collection efforts by such luminaries as Jesse W. Fewkes and Theodor de Booy, which means that they contain some of the key specimens published in the early literature of the area. Like all major Caribbean collections assembled at an early date, these lack detailed archaeological provenance. However, they do often possess information concerning the site, municipality, or province of origin. Over six years, I have assembled a database of 1,100 small carvings of stone, shell, and bone from the Greater Antilles, including 162 from the Smithsonian. I show that despite faults in provenance information, these data can still contribute to the definition of stylistic communities of practice. Such regional communities of practice offer another perspective into current discussions of pre-Contact ethnic and linguistic diversity in the islands. Moreover, using nonmetric multidimensional scaling, I show how chronological information can be extracted from these data.

**Knight-Iske, Geri and Emily Swain (Stantec)**

**[251]** *A Place to Heal: Archaeology at St. Elizabeths Hospital*

Established in 1852 as the Government Hospital for the Insane, St. Elizabeths is situated on a bluff overlooking the historic City of Washington. Charles Nichols, the first superintendent, sought to provide a therapeutic setting in a picturesque environment for mentally ill patients to recover. Originally located outside the main core of the city, the campus has witnessed massive changes over its 150 years of operation. These changes often coincided with innovative new treatment practices for the mentally ill but were not always noted in the historic record, despite annual reports to Congress and extensive map and photographic documentation. Using GIS in conjunction with targeted archaeological investigations, we georeferenced key historic maps and conducted elevation and viewshed analyses to document and confirm many of these changes to the landscape and character of the campus over its lifetime. This paper will explore some of the conclusions we have reached and address the pitfalls of exclusively relying on documentary evidence when evaluating and investigating historical sites.

Knipper, Corina [140] see Fisher, Lynn

Knobloch, Patricia [211] see Jennings, Justin

**Knoerlein, David**

**[138]** *Museum Quality Images Every Time, "It's So Easy an Archaeologist Can Do It"*

With a background in forensics, David Knoerlein, vice president of Forensic Digital Imaging, is a certified evidence photographer who has developed a new and innovative process for the digital documentation of artifacts. Mr. Knoerlein will demonstrate how to capture museum quality images right out of

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the camera. Utilizing a customized tabletop camera station, he will demonstrate how to capture detailed diagnostic images of artifacts with pure white (shadowless) backgrounds. This combination of equipment and procedures will eliminate the need for post-processing (i.e. Photoshop), resulting in time savings while achieving the highest quality image. Mr. Knoerlein will also discuss quality control tracking methods and the use of procedural guides to ensure professional results.

### **Knoll, Michelle**

**[138]** *Wrestling That 200-Pound Gorilla in the Room: Practical Solutions for the Care and Management of Associated Records*

In spite of the broadly recognized importance of associated records, they are often the last part of a collection to be organized, catalogued, and stabilized. Disorganized, or "lost" associated records are a source of frustration for researchers and collection managers alike. Conversely, well-organized and accessible associated records have many benefits to artifact collections including an increase in research potential, a legal foundation for ownership and control, and greater interpretive value. This presentation will discuss how the Natural History Museum of Utah is tackling the challenge of organizing, digitizing, rehousing, and managing over 150 linear feet of associated records. At the heart of this project is the premise that the care and management of archaeological associated records falls somewhere between the missions of archives and records management. As such, new professional standards should be established that meet the needs of this unique collection type.

**[138]** *Chair*

Knothe, Katherine [334] see Jones, Makensie

Knudson, Kelly J. [87] see Blom, Deborah

### **Kober, Brent**

**[193]** *Moderator*

### **Kocer, Jacqueline**

**[115]** *A Summary of Chipped and Ground Stone from Room 28, Pueblo Bonito in Chaco Canyon*

Chipped stone and ground stone from Room 28 backfill included fill from adjacent rooms and lends insight to the technology used during room occupation. I summarize both debitage and formal tool analyses with a special discussion on projectile point types. Most material proportions fall within the range of those in other Chaco Canyon assemblages but with a lower frequency of Narbona Pass and Zuni Spotted Chert. General types of ground stone are discussed in the analysis and jar lid metric data suggest a connection to the cylindrical jars recovered from Room 28. Much of the other ground stone material represents food production and crafting activities, while jar lids may be related to whatever process was used in cylinder jar consumption practices.

Kocer, Jacque [115] see Mattson, Hannah

Kocic, Miroslav [245] see Hanks, Bryan

### **Koenig, Charles (Texas State University, Shumla Archaeological Research and Education Center), Christopher Jurgens (Texas State University), J. Kevin Hanselka (Texas Department of Transportation), Stephen L. Black (Texas State University) and Charles Frederick (Consulting Geoarchaeologist)**

**[187]** *Multidisciplinary Investigations of a Late Paleoindian Bison Butchery Event from a Southwest Texas Rockshelter*

Located in the Northeastern Chihuahuan Desert, Eagle Cave is one of the largest rockshelters in the Lower Pecos Canyonlands. Archaeologists previously excavated Eagle Cave in the 1930s and 1960s; however, no evidence had been recovered indicating Paleoindian occupation of the site. From January 2015 through February 2017, the Ancient Southwest Texas Project of Texas State University re-excavated a 4-meter deep trench through the center of this massive rockshelter in order to document and sample the complex stratigraphy. A primary research objective was to investigate the potential for Paleoindian-age deposits. During the 2016 field season we excavated into deposits older than 8500 RCYBP, and immediately exposed a scattering of fractured, cut, and burned bison bones. Among the bones were chipped stone debitage, lithic tools, decomposing plant remains, and a surface hearth containing charred bone, ash, and charcoal. Based on preliminary analyses and radiocarbon dates, this entire assemblage dates to older than 10,250 cal BP, and represents the secondary butchering and processing of a single *Bison antiquus*. This poster summarizes the ongoing spatial, faunal, macrobotanical, geoarchaeological, chronometric, and lithic analyses being conducted on this unique Late Paleoindian assemblage.

Koenig, Charles [8] see Black, Stephen L.

### **Koenig, Viola (Ethnologisches Museum)**

**[206]** *Connecting Collections: Collectors of Pre-Columbian and Indigenous American Art in the Americas and Europe*

Speakers of this session are dealing with collections and museums in the Americas as well as Europe. They are sharing knowledge on the role of collectors of Pre-Columbian and indigenous American objects that represent the Pre-Columbian era and the colonial and later periods. Many of them were collected in the 19th and first half of the 20th centuries. Ever since collections were subject to all kinds of moves and treatments. Collections were divided, and objects have been dispersed. Can we virtually reunite divided collections that ended up in different museums and continents by creating shared digital platforms? In order to get the ball rolling I will introduce briefly a few different cases as examples of scattered collections housed today on both sides of the Atlantic Ocean.

**[206]** *Chair*

### **Koerner, Shannon (Colorado State University, CEMML), Eric Skov (Colorado State University, CEMML) and Brett Giles (Colorado State University, CEMML)**

**[332]** *Eastern Plains Land Management and Archaeological Site Discovery Methods at Fort Riley, Kansas*

The cultural resource program at Fort Riley manages 100k acres in the Flint Hills province of northeastern Kansas. Variations in the Flint Hills landscape influence the use of different archaeological site discovery methods. While floodplain settings with deep soil deposits necessitate regular subsurface testing, higher elevation settings with low soil accumulation require less intensive survey methods. Many prehistoric sites in higher elevation, upland landscapes are expressed largely by surficial cultural deposits, some dating to the Pleistocene/Holocene transition. This paper highlights the unique Flint Hills landscape and wildland land management practices at Fort Riley that favor the use of pedestrian site discovery methods.

Koerner, Shannon [332] see Giles, Bretton

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**Koetje, Todd (Western Washington University)****[34]** *Leukoma Seasonality and Maturity at WH-55, Implications for the Lacarno Beach Phase in the Pacific Northwest*

In addition to other sites in the middle Salish Sea, Western Washington University field schools have conducted several years of test excavation at 45WH55, resulting in an extensive collection from several spatially distinct areas of the site. Leukoma seasonality and maturity from samples in each area are used to address questions of site integrity and season of occupation. Comparable data from other sites in the region allows preliminary assessment of larger scale movement and seasonality patterns during the Lacarno Beach Phase.

**Kohanski, Neil (California State University, Los Angeles), Toni Gonzalez (University of California, Santa Barbara) and Samantha Lorenz (Contested Caves Archaeological Project)****[157]** *Incensarios, Copal, and Speleothems: Interpreting the Function of Chultun 3 at Mul Ch'en Witz*

Chultunes are ubiquitous throughout the southern Maya lowlands, but their function is still under debate. A central problem in the interpretation of these subterranean features is the paucity of artifacts recovered from within them. Within Chultun 3 at Mul Ch'en Witz, an area located within the larger site of La Milpa in northwestern Belize, several artifacts suggesting ritual activity were encountered. These artifacts include an intact vessel, an incensario, burnt jute, fire-affected limestone, and speleothems. These artifacts were found in association with fragmented human remains, which suggests the importance of the items within the subterranean context. This poster will report on these artifacts, discovered during preliminary excavations by the Contested Caves Archaeological Project (CCAP) in 2017.

**Kohler, Tim A. (WSU/SFI/CCAC)****[1]** *Moderator***[1]** *Discussant*

Kohler, Tim A. [27] see Ellyson, Laura

**Kohut, Betsy (Millsaps College), George J. Bey III (Millsaps College) and Tomás Gallareta Negrón (Millsaps College)****[162]** *A Re-evaluation of Yotholin Pattern-Burnished: Evidence of Early Preclassic Ceramics?*

In 1958, Brainerd first described "the earliest deposits yet to come from Yucatan"—composed primarily of narrow-mouthed jar fragments recovered from the lowest strata of excavations at the Mani cenote. This type, classified as Yotholin Pattern-Burnished, has a medium-fine paste and unslipped surfaces that had been smoothed or burnished in decorative patterns.

Since then, similar wares have been recovered from Preclassic contexts at a number of other sites. Although Brainerd originally described Yotholin as an Early Preclassic type, other archaeologists have attributed it to the late Middle Preclassic. In this paper, we will revisit the contextual evidence surrounding Yotholin and discuss it in light of our work in the Puuc and recent reevaluation of Middle Preclassic ceramics in general. This reanalysis suggests that Brainerd's initial interpretation of Yotholin was correct and that it is contemporaneous with and/or slightly predates early Middle Preclassic Ek phase ceramics (900–700 BC). It is possible that Yotholin represents the earliest pottery yet identified in the Northern Lowlands. We examine the implications this would have for understanding the origins of the Maya in this region.

Kohut, Betsy [162] see Galvan, Melissa

**Kohut, Lauren (Tougaloo College)****[75]** *Legacies of War: Fortified Landscapes and Political Transformation during the Late Prehispanic in the Colca Valley (Arequipa, Peru)*

During the Late Intermediate Period (AD 1000–1450), frequent warfare radically transformed the landscape of the Colca Valley in the southern Peruvian highlands. Widespread fortification not only marked a new defensive landscape, but also reflected and reinforced broader social and political transformations—including increasing settlement nucleation and the coalescence of new ethnic identities. Although many of the valley's fortifications were largely abandoned following the region's incorporation into the Inka state, this fortified landscape continued to shape social and political processes. The two largest fortified settlements not only continued to be inhabited, but grew and were transformed into local Inka administrative centers. This paper examines how the fortified landscape of the Colca Valley shaped long-term social and political processes drawing both on analysis of the importance of fortifications in the changing settlement patterns in the valley, and the local transformations of the large fortified settlements of Auquimarka and Malata. In doing so, this paper expands upon the notion of fortifications as "landscape patrimony" (sensu Arkush 2011), by exploring how defensive landscapes not only shape and entrench social and political relationships, but also how such built landscapes of war are themselves reimagined and reinterpreted in the face of social and political change.

**[235]** *Moderator***Kolata, Alan (University of Chicago)****[273]** *Discussant***[273]** *Chair***Kolb, Charles (National Endowment for the Humanities (Retired))****[69]** *Revisiting Clay Smoking Pipes*

An assemblage of 280 white clay smoking pipe fragments were recovered from a disturbed context during the construction of a marine basin and wharf at Barcelona Harbor, New York, on the southeastern shore of Lake Erie. Apparently packed in a wooden box or crate, this collection represents one of the largest unique and homogeneous collections fabricated during a brief period in a single manufactory from only a few molds. I summarize descriptive and quantitative analyses, probable provenance, and focus on date of manufacture. English pipe stems are assessed using four procedures: Harrington's (1954) histogram of time periods; Binford's (1962) linear formula; Hanson's formulas (1971) and the Heighton and Deagan formula (1972). Harrington's histogram of five basic time periods proved useful but the idea was critiqued and expanded; Binford converted the progression an easily-understood mathematical straight-line regression formula applied to most pre-1800 British colonial and federal sites. However, Noël Hume and Walker provided examples of Binford's formula that yielded dates inconsistent with other dating methods. Hanson proposed ten straight line regression formulas to replace Binford's single formula, and Heighton and Deagan developed a curvilinear regression formula based on bore size research. The results are contrasted.

Kolb, Michael J. [23] see Kirk, Scott

**Kolbenstetter, Marie (McGill University)****[299]** *"Les Niveaux Céramiques au Honduras" Revisited: The Gulf of Fonseca in Regional Context*

In 1966, Claude Baudéz published a first attempt to compare ceramic typologies between different archeological areas of Honduras, published as *Les niveaux céramiques au Honduras: une reconsidération de l'évolution culturelle* (Baudéz 1966). This article encompassed his research in the Gulf of Fonseca, where he spent a field season surveying and excavating sites in 1964–65. Fifty-three years later, this article still constitutes one of the most



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extensive descriptions of the ceramic assemblage of the Honduran side of the Gulf. However, research in the surrounding regions of the Gulf in El Salvador, Nicaragua, and Honduras, has considerably advanced in the last thirty years, and contributed to a better understanding of ceramic types and their distribution. Through a renewed analysis of a sample of the ceramic material excavated by Baudez in the Gulf of Fonseca and a review of his typology, my paper presents updated considerations about distribution of ceramic types present in the Gulf of Fonseca between the Classic and Late Post-Classic periods, with a focus on the Late and Terminal Classic. To this end, recent research and established typologies are reviewed and compared as an attempt to create relations and equivalences between types, leading to better understanding of local variations.

Koldehoff, Brad [140] see Parish, Ryan

**Koller, Jared (Boston University) and Stephen Acabado (University of California, Los Angeles)**

**[230]** *Under the Church Bell: Reducción and Control in Spanish Philippines*

The Spanish conquest of the Philippines redesigned the indigenous landscape to adhere to the idealized orthogonal plan outlined by King Philip II's Ordinances of 1573, centered on the church plaza. This reconfiguration facilitated the successful political, economic, and religious control of the colonial possession. An aspect of this resettlement plan is the concept of Bajo de Campana (under the bell) that implied control through the ringing of the church bell. The plaza complex, which is exemplified by the policy of reducción, projects a Spanish ideal Catholic Society, whereby the configuration of the physical landscape was ordered. Reducción aimed to consolidate colonial control over Philippine indigenous communities by compelling prominent individuals to relocate into poblaciones within hearing distance of church-bells. Bell ringing ordered daily life by signaling times to congregate and by marking special occasions. The audibility of church-bells also marked the extent of the Crown's territorial holdings. To understand the processes associated with this colonial accommodation, we explore the social, religious, and environmental ramifications of Spanish settlement-building programs in the Philippines by examining spatial, acoustic, ethnohistoric, and archaeological data from plaza complexes located at two Spanish-era church sites: Quipayo and St. Francis of Assisi (both established in 1578).

**Kollmann, Dana**

**[62]** *Discussant*

**Kolpan, Katharine (Iowa State University)**

**[282]** *The Dread of Something after Death: Ownership, Excavation and Identification of World War II Axis Combatants in Europe*

Human remains possess an indexical quality that references once-living people. Human bone may also serve as a symbolic representation of larger ideas such as honor, vengeance or injustice. As such, human remains, as evidence of past criminal actions, have the ability to bring communities together, but also to tear them apart. In regard to the remains of soldiers who perished in the European theater during World War II (WWII), the presence of remains may serve to reinforce the perceived moral failings and criminality of other communities. However, they may also underscore the idea of victimization, even among people who might also have been considered the perpetrators of atrocities. Among the German dead from WWII, the remains themselves have highlighted the mythologized suffering of the German soldiers—particularly in the East—at the close of WWII, while also serving as a terrible reminder of the pain caused to the myriad communities victimized by the Reich. Meanwhile, the excavation of potentially Italian or Austrian Axis combatants has proved more complicated because the discovery of these soldiers disrupts long established narratives of Italian and Austrian victimhood.

**[282]** *Chair*

**Kolyer, Glenn (CUNY Graduate Center)**

**[5]** *The Bryant Site: Five Prehistoric Loci in the Esopus Creek Drainage*

Excavation of large sites in the Hudson Valley is often limited to the availability of resources and labor. The Bryant Site of Ulster County, New York, is a Late Archaic site located on approximately 54,000 m<sup>2</sup> of horizontal surface area on privately owned farmland. Scientific sampling of the site was conducted through survey using a grid-based plan. Each grid square was analyzed for debitage, fire-cracked rock, and lithic artifacts. The results of each unit were contrasted and compared. Through analysis of each square, five possible loci of prehistoric activity were discovered. While surface collections are not without their disadvantages or bias, and cannot replace excavation in terms of evidence collection, this process yielded data which was used to infer potential site use, seasonality, and dietary behavior. The data collected opens the door for future excavation and potential testing of long-term prehistoric settlement in the area.

Komakech, Wilfred [282] see Elgerud, Lucia

Komp, Rainer [190] see Ruby, Bret

Konzak, Michael [221] see Whitley, Thomas

**Kooiman, Susan (Michigan State University)**

**[133]** *Foodways and Technological Transformation in the Upper Great Lakes: A Multidimensional Analysis of Woodland Pottery from the Cloudman Site (20CH6)*

A novel combination of analytic methods is used to address the decades-long debate about diachronic subsistence pattern change during the Woodland period (AD 1—1600) in the Upper Great Lakes of North America. While some have argued for dietary continuity throughout the regional Woodland, others maintain that certain specific resources—including fish, wild starchy plants, and/or maize—were more intensively exploited over time. The Cloudman site (20CH6), located on an island off Michigan's Upper Peninsula in Lake Huron, is a multicomponent occupation spanning the Middle through late Late Woodland periods. The ceramic assemblage is therefore ideal for assessing dietary and technological change through time. Functional pottery analysis (of technical properties and use-alterations traces), stylistic pottery analysis, microbotanical analysis, absorbed lipid residue analysis, stable isotope analysis, and AMS dating are used in tandem to construct a chronological sequence of diet, cooking habits, and cooking technology and the relationships between them. The rich data resulting from the complementary nature of these diverse methods demonstrates the potential applications of this analytic suite to long-standing archaeological problems in other contexts.

**Koole, Edward (Edward Koole)**

**[127]** *Paleo-Indian Evidence from Rock Shelters of the Pains Region, Southeastern Brazil: Typology, Technology and Chronology of the Lithic Material and Its Classification in Three Horizons*

This presentation describes the archaeological context and the lithic variability for the paleo-indian period of the Pains region, an extensive karst situated in the upper São Francisco river valley, state of Minas Gerais, Southeastern Brazil. It gives an overview of what is known for the region using evidence from four limestone rock shelter sites, with a total area of 28m<sup>2</sup> excavated, the most important site being the Gruta do Marinheiro cave (20m<sup>2</sup>),

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and propose the separation of the lithic material of the region in three main industries, differentiated in terms of technology and typology as well as chronology, called Horizons, that reproduce regionally, the materials and archaeological contexts found in the Central as well as the Southern territories of Brazil.

Koolstra, Francis [34] see Cakirlar, Canan

**Koontz, Rex (University of Houston)****[128] *A Tajín Deity Associated with Decapitation Sacrifice***

This presentation investigates the narrative context of a Tajín region deity whose diagnostic characteristics include a large hank of hair and an extended upper lip.

The figure appears in narrative scenes with the major Tajín deities, often playing what seems to be a subsidiary role. The most important association in these scenes is with a liquid-filled temple that plays a key role scenes of ballcourt ritual. The same deity appears in pars pro toto representations of sacrificial scenes with numerous figures from the Tajín court. Finally, the deity also appears in a complex aquatic scene on a portable sculpture. Certain consistencies in the imagery across narrative contexts and media suggest that this figure embodies the fruit of particularly important decapitation sacrifices. The depiction of decapitation sacrifice as a supernatural suggests that Tajín participates in the “animate head” symbolics that have been identified for large areas of the Americas, as described by Gillespie and others.

**[128] Chair**

**Kornfeld, Marcel (PIRL—University of Wyoming) and Mary Lou Larson (PIRL—University of Wyoming)****[127] *Things Forgotten: The Unique of the Hell Gap Site***

Forager campsites are commonly thought of as locations where social activities occur, but most archaeologists focus on subsistence (butchery, processing), stone tool production and use, and how these systems relate to mobility strategies. The record is often silent when it comes to the behaviors incidental to what appears central economic endeavors. Often camps yield information beyond subsistence. Ochre, needles, beads, bone rods, structures, and context of various activities provide more holistic evidence of Paleoindian lifeways. Our paper considers implications of such remains at the stratified Pleistocene/Holocene boundary Hell Gap site.

**Kosakowsky, Laura (University of Arizona)****[258] *“Pots, Potters, ...and Politics”: Classic Period Ceramic Spheres and Systems at Aventura, Northern Belize, and the Legacy of Joe Ball***

Early work in the 1970's by Joe Ball on Northern Belize ceramics from the site of Aventura highlighted its geopolitical location between multiple spheres of interaction. These spheres, reflected in the ceramics of the Classic Period, demonstrate that Aventura's intermediary position between the cities of the Petén to the west, and the Yucatan to the north no doubt contributed to its success and long occupation. My own research on the Aventura ceramics, begun in 2015 as part of the Aventura Archaeology Project, supports Joe Ball's early observations on Classic Period ceramics in Northern Belize. Furthermore, his important definitions of ceramic spheres and systems provide an excellent way to frame Aventura's long chronology and inter-regional connections through time. While still in its preliminary stages, I am hopeful that continuing work on the ceramics of Aventura will go beyond establishing a site and regional chronology, and highlighting inter-site connections, to telling us something more about “ancient Maya economic systems, political history, ceremonial behavior, ideology, societal structure, and community organization.” (Ball 1993)

**[317] Discussant**

Kosakowsky, Laura [147] see Robin, Cynthia

**Kosiba, Steve (University of Minnesota)****[230] *Crumbling Infrastructure: Archaeological Perspectives***

Recently, the term “infrastructure” has gained a remarkable degree of traction in both academic and political discourses. Politicians, from the left and right, bemoan what they term “crumbling infrastructure,” offering fixes by way of material and technological improvements to roads, waterways, cities, and energy grids. Scholars draw on and expand posthumanist theories to analyze and expose how infrastructure does not just passively support social aims, but actively shapes (and subverts) human intentions. These discussions sharpen focus on the material characteristics and necessities of infrastructure, but frequently neglect to equally take into account the ideological mechanisms—processes of labor coordination, perceptions of progress, or projects for sustainable ecology—that are essential to and inseparable from infrastructure. With this paper, I ask how archaeologists, with their unique ability to record and interpret long-term socio-material processes, might add to such discussions of infrastructure. I argue that “crumbling infrastructure” is a misnomer because it defines infrastructure as fixed materials rather than fluid entities that are parts of broader assemblages comprising things, people, and ideas. I present data from Cusco, Peru, during early Spanish colonization to examine the interwoven ideologies and materials that can bring infrastructure into being, and relegate it to ruin.

Koskey, Michael [250] see Skinner, Douglas

**Kosyk, Katrina (McGill University)****[263] *Communities of Engaged Performance: Investigating Soundscapes and the Sonorous Past***

The relationship between individuals and urban soundscapes can tell us about the personhood and sonic practices of people in the past. To reconstruct the interaction between a musician and audience in archaeological contexts, I introduce a novel theoretical framework called ‘communities of engaged performance’ (CEP). CEP is defined as the transmission of knowledge through performance resulting in variable group-specific sound practices. CEP is derived and builds upon theories of ‘communities of practice’ and is identifiable in the archaeological record as intentional modifications to both space and sound-related artefacts. CEP is especially pertinent to the discussion of multicultural social organization, because it denotes group identity based on consistencies within practices rather than by ethnic origin. For example, variation in instrument design, playing of a musical instrument (gestures, finger positions, etc.), or in soundscapes might suggest the presence of several distinct communities of engaged musical performance. On the other hand, consistency or shared practices across groups might reflect the development of a single performance community. A case study from Central America will explore these different aspects of CEP in a multi-ethnic landscape.

Kotar, Kathryn [16] see Walker, Samantha

**Kotegawa, Hirokazu (Museo de Córdoba, Ver.)****[19] *¿Cuáles son los monumentos olmecas del sitio Estero Rabón?***

Uno de los grandes problemas de los monumentos escultóricos olmecas es que, para identificar la cronología y la cultura pertinente, la mayoría de ellos se ha perdido el contexto arqueológico. Por ello, existen algunos monumentos dudosos por su estilo y los de la procedencia desconocida en el

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corpus total de ellos. El sitio Estero Rabón es conocido como uno de los centros secundarios de San Lorenzo y fue reportado con la presencia de varios monumentos escultóricos olmecas. Sin embargo, casi todos estos monumentos del sitio no se saben la ubicación en donde fueron encontrados dentro del sitio. Hasta la publicación del catálogo de monumentos olmecas en la región de San Lorenzo Tenochtitlán por Ann Cyphers en 2004, los ocho monumentos fueron reportado aunque uno de ellos fue desaparecido actualmente. Esto fue ocurrido por la causa del abandono del sitio académicamente.

Durante los trabajos de excavación en este sitio realizados 2012–2015, los pobladores de la región nos reportaron la existencia de otras esculturas de piedra en el formato grande. Así, fue comenzado nuevamente un estudio sobre los monumentos olmecas del sitio. En el presente estudio, se analizarán estos monumentos del sitio Estero Rabón aclarando algunas confusiones para futuras investigaciones.

Kotegawa, Hirokazu [285] see Aguilar, Magdalena

**Kotis, India (Kenyon College) and Jenna Hurtubise (University of Alabama)**

**[265] *Deciphering Social Structure: A Cognitive Approach in Examining Casma and Chimú Ceramic Iconography***

The choices groups make in the type of decorative techniques and styles on ceramics are referential to key components of a group's social structure. This research examines social aspects of the Casma and Chimú using a cognitive approach in analyzing iconographic elements on elite ceramics from Pan de Azúcar, located in the Nepeña Valley, Peru. Casma ceramics are locally made vessels where no two are alike and are characteristically defined by the presence of circle-and-dot and serpentine appliques. Comparatively, Chimú ceramics are mass-produced mold made vessels that are identifiable by its' polished exterior decorated with intricate designs and bird and monkey appliques. Based on the type of iconography the Casma and Chimú used for social expression we argue that the Casma were an internally driven culture while the Chimú were an externally driven culture. Additionally, elements of Chimú iconography show evidence for their imperialistic disposition and give us insight into the interaction between the Casma and Chimú during the Late Intermediate Period (A.D. 1000–1400) in the Nepeña Valley.

**Kotoula, Eleni (University of Central Lancashire), David Robinson (University of Central Lancashire) and Clare Bedford (University of Central Lancashire)**

**[214] *Diagrammatic and Interactive Relighting Visualizations of Pictographs: Case Studies on Pinwheel, Boulder and Pleito Cave***

This presentation discusses two complementary approaches for visualization of pictographs; interactive relighting and diagrammatic representation. Visible and false colour Reflectance Transformation Images (RTI) provide enhanced visualization of texture in combination with colour enhancement. By extension, the proposed techniques offer the opportunity to explore the characteristics and application of paint as well as the layering and preservation state of pictographs. The extracted information can be formatted according to DOT language syntax and rendered in GraphViz as diagrams. The resulting diagrams are not only alternative ways for communicating analysis results but also useful tools for enhanced detection of patterns within a single pictograph and across panels. As demonstrated by case studies on Pinwheel, Boulder and Pleito cave (CA-KER-77), which showcase different scale and level of complexity, the comparative assessment of interactive relighting and diagrammatic visualizations is a step towards a more holistic approach for rock-art recording, documentation and analysis, that can be further enriched by spectroscopy and 3D digitization.

**Kotsoglou, Anastasia (Cornell University), Samantha Krause (University of Texas at Austin), Luisa Aebersold (University of Texas at Austin), Fred Valdez (University of Texas at Austin) and Timothy Beach (University of Texas at Austin)**

**[243] *Soils, Sedimentary Rocks, and Scale: Recent Geoarchaeological Investigations at Colha, Northern Belize***

The Maya site of Colha is located on a karstic doline that is dominated by Tertiary and Pleistocene limestone and marls. This low-lying area, known locally as the Cobweb depression, encompasses a complex wetland system that is affected by Holocene sea level rise, human-induced vegetation changes, and both natural and anthropogenic erosional sequences. The dynamic landscape, coupled with a long history of human occupation, places this site in a complex geographic and cultural position within the greater Maya Lowlands. This paper focuses on the interplay between natural soil formation sequences, the built environment, and the temporal changes in resource extraction and utilization within the Colha core. Here, we specifically build upon previous research on soils and sediments of the greater Cobweb Swamp depression and how these soils form onsite. Accelerator Mass Spectrometry (AMS) dating, Magnetic Susceptibility, and Loss On Ignition methodologies are employed to further characterize the present soils and geologic resources. Geochemical and elemental techniques are applied to lime plaster samples in order to determine sourcing and production during Preclassic occupation. The data proffered from these analyses highlight the unique geologic context of Colha, demonstrate how these environmental resources were manipulated, and supplement broader work on local human-landscape interactions.

Kotsoglou, Anastasia [243] see Burns, David

**Koutlias, Lauren (Texas State University) and Annie Riegert (Texas State University)**

**[302] *Deviancy, an Alternate Means of Child Veneration at the Maya Site of Colha***

The veneration of space is a process that at times incorporates deviant practices as a method of signifying key importance. The deposition of burnt infant remains and associated grave goods diverges from burial norms at the Maya site of Colha. In May of 2017, archaeologists with the Programme for Belize Archaeological project returned to the site after a multi-year hiatus. The burnt skeletal remains of an infant, between the ages of 1.5 and 2.5 were found in association with burnt pottery sherds, bifaces, and shells. The burial deviates from Maya inhumation practices at Colha and in Northwestern Belize generally and therefore signifies ritual practice of great import. The interment of remains and grave goods are associated with the structure 2032 in the 2000 sector. The location, presence of burning, and differential inhumation signifies the importance of this structure and are hypothesized to have contributed to a dedication or termination ritual of the associated structure. We explore the use of burning and child inhumation practices as a ritual method for structure commemoration.

**Kovac, Milan (Comenius University in Bratislava)**

**[252] *Uaxactun as the Preclassic Dominant of Central Peten***

In the beginning of the 20th Century Uaxactun was considered to be the cradle of the Maya civilization. Later, other monumental Maya centers were found and scholars lost interest for Uaxactun. The former popularity of Uaxactun was interpreted as just a coincidence because the first large excavations were carried out there. Newly identified important Maya sites were considered to be older and more interesting. The new archaeological project in Uaxactun has dealt with the Preclassic horizon of the site for the past 10 years and recent results confirm that the first impressions 100 years ago were not so far from the reality. Uaxactun was ruled by the first Maya king's dynasties and has the biggest king's residence in the Preclassic Central Peten. Among the extraordinary findings are the largest stucco masks of the Maya world, amazing and large stucco decorations, a dynastic shrine with preclassic inscriptions on a jade scepter, fine Preclassic inscriptions on stelae and last but not least astronomic complexes of extraordinary accuracy. Fine art, early inscriptions, richness and monumentality of architecture lead us to the conclusion that in Preclassic times Uaxactun was politically and culturally one of the most important cities of the Maya world.

Kovac, Milan [33] see Beliaev, Dmitri

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Kovacevich, Brigitte [28] see Crawford, Dawn

**Kowalewski, Stephen (University of Georgia)**

[170] *Economic Institutions in Ancient Greece and Mesoamerica*

New studies have led to a deeper comprehension of economic variation and change in Late Postclassic Mesoamerica and the Archaic and Classical Greek world. Archaeological data on city-state settlement patterns, specialized production, trade, and household consumption, and new archival material and re-analysis of texts, have replaced primitivism, substantivism, and ideal-types.

In urbanization and demographic scale the two areas are comparable. Mesoamerican and Greek agricultural production was not simply for subsistence, but was market-oriented and market-dependent. Local and long-distance trade often functioned by market mechanisms. The economies had the capacity for real growth beyond Malthusian pace-keeping.

Greece and Mesoamerica contrast in their current states of method and theory. Mesoamerica has better samples of city and hinterland settlement patterns. Ancient Greece has fuller textual sources. Research on the Greek economy is more in touch with economic theory.

I focus on two differences. The Old World used silver and state-issued coinage as money; Mesoamerica had goods monies. In the Old World the firm, or corporate group for jointly carrying out economic activities, was larger than in Mesoamerica, where the household was the locus of specialized production. These differences had consequences in the relative capacity for appropriation and accumulation.

Kowalski, Jessica [84] see Weinstein, Richard

Koyiyumptewa, Stewart B. [72] see Price Steinbrecher, Barry

**Koziarski, Ralph (AECOM)**

[39] *Good Living in Hard Times: De-urbanization and Personal Wealth in Nineteenth Century New Market, Maryland*

New Market is a small community in Frederick County, Maryland, whose origins and early nineteenth century economic peak are tied to travel and trade, on the National Turnpike. Following the development of the B&O railroad during the mid-nineteenth century, use of the turnpike declined, subsequently shrinking the town's economy.

Excavations sponsored by the Maryland State Highways Administration have recovered datasets from two properties in New Market. Identified components include a late eighteenth century tavern or inn, an early nineteenth century home, mid-nineteenth century parsonage and workshop, and a late nineteenth to early twentieth century African-American home.

Faunal remains collected from each component were used to establish the relative economic and nutritional value within each assemblage. Access to meat at each component was then measured against the economic potential of the community as a whole, as documented in the historic record. Preliminary results show that decline in personal wealth, as measured by ability to purchase meat, lagged behind the decline of New Market as a commercial center. The lag may relate to improvements in trade and communications, which had allowed for the decentralization of the local economy, which in turn allowed individual actors to weather economic declines at specific nodes.

Kramer, Karen [63] see Greaves, Russell

Kramm, Natalie [168] see Connolly, Robert

**Krantz, Sarah (Barnard College, Columbia University)**

[8] *Interpreting Palimpsest Rock Art in the North American Southwest*

This paper examines what might be called the "palimpsest panel" rock art tradition of the northern Rio Grande region of New Mexico. Palimpsest panels are rock faces with petroglyphs that have accrued in a layered fashion through time. Prior research into such panels has typically focused on questions of chronology, each layer representing a distinct culture-historical era of iconographic production or a chapter in a linear chronology. Here, however, I move away from the traditional chronological approach, in order to examine the iconographic data present in the form of representation itself, the so-called palimpsest. The way that meaning develops through the act of layering itself is a process by which the icons interact and modify one another. Such an approach reveals not only the rich, information-laden periods between discrete chronological chapters but also demonstrates that palimpsests are far more than the sum of their parts.

**Krasinski, Kathryn (Adelphi University), Brian Wygal (Adelphi University), Charles Holmes (University of Alaska, Fairbanks) and Barbara Crass (University of Wisconsin-Oshkosh)**

[50] *Investigations of the Late Pleistocene Occupations at Holzman, Shaw Creek, Interior Alaska*

The Holzman site, discovered in 2015, is roughly one half mile from the confluence of Shaw Creek with the Tanana River in interior Alaska. To date, we have excavated 56m<sup>2</sup>, revealing repeated occupations beginning in the Bolling-Allerod, and including an occupation in the Younger Dryas. Located near the Broken Mammoth, Mead, and Swan Point late Pleistocene sites, Holzman consists of a local stone flaking station, hearths, and thousands of faunal remains including organic implements on mammoth ivory. This paper reports initial zooarchaeological, lithic, and geochronological analyses placing Holzman in the broader context of the peopling of Alaska and the Americas.

**Krause, Samantha (University of Texas at Austin), Timothy Beach (University of Texas at Austin), Sheryl Luzzadder-Beach (University of Texas at Austin), Thomas Guderjan (University of Texas at Tyler) and Fred Valdez (University of Texas at Austin)**

[173] *Canals, Sacbeob and Defining Space in Ditched Agricultural Fields in the Three Rivers Region, Northwestern Belize*

In 2016 the Northwestern Belize Lidar Consortium acquired nearly 300 square km of LiDAR imagery that covers large areas of ancient Maya agricultural systems, including ditched and raised fields, reservoirs, terraces, and sacbeob. This new imagery allows us to map beneath the canopy and shows that over nearly 20 years without LiDAR we studied only a small spatial sample of these complex systems. We have tested these systems with multiple excavations, and used multiple proxies such as paleoecology, elemental geochemistry, and isotope analysis to reconstruct Maya management within wetlands. Through new LiDAR technologies and continued on the ground excavations, the study of these Maya agroecosystems has entered a period of great dynamism. The coverage of systems in northwestern Belize indicates intensive, polycultural complexes of upland terraces and wetland fields. Here, we present our current state of knowledge of the Birds of Paradise agricultural zone based on previous research and our new, ground-truthing through mapping and excavation efforts from the summer 2017 field season. Based on these new efforts we can better understand wetland agriculture both spatially and temporally within the framework of Maya urbanism and agricultural management in the Three Rivers Region.

Krause, Samantha [243] see Burns, David

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Kretzler, Ian [114] see Dewan, Eve

Krier, Jon [303] see Curteman, Jessica

Krigbaum, John [9] see Wallis, Neill

**Kriss, Dawn (Objects Conservator), Ellen Howe (Metropolitan Museum of Art, conservator emeritus) and Judith Levinson (American Museum of Natural History)**

**[141]** *A Technical Study of Post-Fire Painted Paracas Ceramics: Regional Exchange and Material Culture*

The Paracas culture and its impressive pottery tradition developed along the south coast of Peru in the Early Horizon period (approximately 800–100BC). A scientific study of manufacturing techniques and materials of post-fire painted Paracas ceramics at the American Museum of Natural History (AMNH) and Metropolitan Museum of Art (MMA) found a correlation between changes in material use and iconography and vessel form across time. Differences between colorant composition in the Formative/Early (approximately 900–500BC) and Middle (approximately 500–400BC) Paracas Periods suggest a shift in material usage, which correlates with likely cross-cultural exchange and interaction with the Chavin culture to the north. Additionally, a basic continuity in the production techniques utilized to form the Paracas ceramics and decorate their surfaces suggests an extensive network of regional exchange and collaboration. Differences identified in the paint plant binders further illustrate the importance of examining archaeologically excavated pieces in order to correlate differences that may be attributable to chronological sequencing or regional differences.

**Kristan-Graham, Cynthia (Auburn University)**

**[28]** *The Poetics and Politics of Acoustics at Chichen Itza, Yucatan, Mexico*

An archaeology of the senses expands the understanding of physical, tangible aspects of place to include qualities that are unseen, silent, or otherwise not readily perceptible. My paper analyzes acoustics at the late Maya capital of Chichen Itza. Sound—especially the human voice, animals, music, ritual, and dancing—were part of Chichen Itza's atmosphere. An analysis of soundscapes, along with the intersection of architecture, planning, and acoustics, augments what is known about the site's settlement, rituals, epigraphy, and imagery. For example, sounds could be heard in only a part of this large site. Consequently, sound at ground level and inside or atop buildings can be understood as limited resources available to different audiences and sectors of the site. Using digital archaeology to plot soundscapes, I consider how acoustics may have influenced the site plan; how acoustics may have embodied political and social concerns; and how Maya notions about sound expand an understanding of Maya places.

**Kristiansen, Kristian**

**[113]** *The Maritime Mode of Production: The Role of Seafaring in Bronze Age Societies*

As exemplified by Viking and Bronze Age societies in northern Europe, we model the political dynamics of raiding, trading, and slaving as a maritime mode of production (MMP). It includes political strategies to control trade by owning boats and financing excursions, thus permitting chiefs to channel wealth flows and establish decentralized, expansive political networks. Such political institutions often form at edges of world systems, where chieftains support mobile warriors, who were instrumental in seizing and protecting wealth. Particular properties of the MMP as relevant to Scandinavia are the fusion of agro-pastoral and maritime forces of productions.

**[319]** *Discussant*

Kristiansen, Kristian [245] see Earle, Timothy

**Kroot, Matthew (Santa Clara University)**

**[160]** *Discussant*

**Kruchten, Jeffery (Archaeological Research Center of St. Louis, Inc./ University of Illinois)**

**[26]** *Thunder, Lightning, Wind, and Rain: Exploring Engagements with Elemental Entities in the Closing of Emerald*

The Emerald Acropolis is an early Mississippian shrine complex constructed atop a high upland ridge approximately 25 kilometers east of Cahokia in southwestern Illinois. The termination and abandonment of a suite of special-use buildings located along an isolated spur at the base of the main ridge is strikingly different than the termination of similar non-domestic buildings throughout the region. These buildings, including large public structures, shrines, temples, and a sweat lodge, are adjacent to one of several ancient springs that would have been a powerful presence at the site. The closing of this portion of Emerald sometime during the early part of the Stirling phase (1100–1200 CE) is rife with water symbolism, including structured water-lain deposits and offerings that have ethnohistoric associations with Thunderbirds and violent thunderstorms. In this paper I establish thunder and associated elemental forces as sentient entities in the Mississippian world, and explore the engagement with them by those Cahokians concerned with the closure of this isolated cluster of buildings. Understanding Cahokians' relationships with these entities may shed light on the shifting socio-politics of the region during a potential time of stress

**Krueger, Bradley (National Park Service)**

**[202]** *Of Wharves and Watercraft: Exploring the Maritime Archeology of Theodore Roosevelt Island*

Situated in the Potomac River within the District of Columbia, Theodore Roosevelt Island serves as a living memorial to the 26th president of the United States. Secluded from the bustling capital city, the island's rich history extends beyond the memorial itself. It served as a site of American Indian occupation in the pre-contact era, hosted John Mason's plantation beginning in the late eighteenth century, was the training ground for the 1st U.S. Colored Troops during the Civil War and then home to African American refugees fleeing the South, and finally used for various recreational purposes through the early twentieth century, all prior to becoming a presidential memorial. Tightly woven into this history is a distinctly maritime thread, as the island could only be accessed by water prior to 1807. Even afterwards, water-based transportation and recreation continued to take place within the island's unique landscape. Remarkably, remnants of these maritime components are still preserved on the island today. From wharves to watercraft, this presentation summarizes the maritime history of the island and highlights two maritime archeological features.

**Krueger, Erica (Florida Gulf Coast University), Jon Wittig (Florida Gulf Coast University), Michael Savarese (Florida Gulf Coast University), Kylie Palmer (Florida Gulf Coast University) and Antonio Arruza (Florida Gulf Coast University)**

**[224]** *Impact of Oyster Overharvesting in Southwest Florida by Calusa Native Americans*

Recent research has demonstrated that overharvesting of Eastern oysters (*Crassostrea virginica*) by Calusa Native Americans was severe enough during the Caloosahatchee cultural period (500 BC–AD 1500) to have influenced the population demography of the shellfishery (Savarese et al., 2016). A shift to smaller individuals without a change in oyster growth rate was documented from the Late Archaic into the Caloosahatchee when Calusa population size increased considerably in the region. Modern oyster populations exhibit a return to Late Archaic size, suggesting that the Calusa did not impose a permanent genetic change on oyster capacity for growth. These patterns were displayed for two estuaries in Southwest Florida: Estero Bay and Pine Island Sound. New data from recent excavations from Mound Key, Estero Bay, further support these interpretations. 35 samples spanning ~

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AD 1000–AD 1400 all exhibit similar small sizes consistent with the Late Caloosahatchee period across the broader region. Additionally, taphonomic grading (sensu Savarese et al., 2016) also demonstrates that Mound Key's midden oysters were harvested for consumption, rather than mined strictly as building material. The relatively pristine preservation of oyster valve interior surfaces is consistent with the removal of oysters from their estuarine environment while alive and still articulated.

**Krug, Andrew (University of Missouri), Kyle Waller (University of Missouri) and Christine VanPool (University of Missouri)**

**[225]** *Isotopic Approaches to Marine Shell Exchange in the Southwest*

Excavations have uncovered millions of marine shells throughout the Southwest. However, it was not an easily obtainable resource. The nearest possible location was the expansive shorelines of Sonora, Mexico. Archaeological literature is full of hypotheses regarding shell procurement and exchange—models of down-the-line trading, least cost, prestige, and group membership. Each of these hypotheses agrees that where and whom the people of the Southwest interacted with to acquire marine shell are important to understanding regional exchange. A narrower geographic location would offer a more comprehensive understanding of the interactions between the procurers of shell and those that sought the molluscs. In this study, we further studies of economic interaction by comparing carbon and oxygen isotope ratios of Olivella, Conus, Glycymeris, and Nassarius shell from 76 Draw, a Casas Grandes site near Deming, New Mexico, with several published modern Gulf of California datasets. Building upon previous isotopic analyses of Southwestern shell, we determine the provenience of marine shells from 76 Draw and propose a model of marine shell exchange for the Casas Grandes world.

Krug, Ronald [48] see Neff, Linda

**Krummel, Jordan and James Watson (The University of Arizona)**

**[88]** *Archaeoethanatomical Analysis of Mortuary Practices in the Prehistoric Sonoran Desert and Implications for Interpreting Sickness through Postmortem Processing*

The La Playa archaeological site in the Sonoran Desert represents one of the earliest agricultural settlements in northwest Mexico. Over 310 mortuary features have been uncovered during salvage excavations since the site was discovered in 1930, revealing a wide variability in mortuary practices that may reflect specific treatments for pathological or transgressive individuals after death. This paper describes analyses of burials uncovered during the 2017 field season utilizing the taphonomy-centered archaeoethanatomical approach to excavation and interpretation. Using this approach, specific consideration was given to a number of burials with destructive cranial lesions that may be evidence for the earliest known cases of treponemal disease in the North American Desert West. Additionally, deviant burials uncovered during past excavations were reconsidered for evidence of pathology only visible using archaeoethanatomical analyses. Analysis revealed new insights into the mortuary behavior of these early agriculturalists, particularly concerning corpse processing before primary inhumation as well as cultural understandings of sickness. This has implications regarding social organization and the array of observed burial patterns at La Playa, from cremation, single and multiple burials, and deviant burials. These findings paint a broader picture of prehistoric inhabitants of the Sonoran Desert for whom limited cultural material has survived.

**Krus, Anthony (Scottish Universities Environmental Research Centre) and Charles Cobb (Florida Museum of Natural History)**

**[119]** *The Mississippian Fin de Siècle in the Middle Cumberland Region of Tennessee*

Bayesian chronological modeling is used to investigate the chronology for a large-scale human depopulation event during the Mississippian period (A.D. 1000–1700) known as the Vacant Quarter phenomenon. The Middle Cumberland Region (MCR) of Tennessee is within the Vacant Quarter area and six villages from the final phase of Mississippian activity in the MCR have been subjected to radiocarbon dating. Complete radiocarbon datasets from these sites are presented within an interpretative Bayesian statistical framework. The results provide a unique history of each settlement and demonstrate that Mississippian occupations at each site likely terminated in the mid-to-late fifteenth- and possibly early sixteenth-centuries A.D., which is 50–100 years later than the most recent estimate for the timing of the Vacant Quarter. Mississippian abandonment in the MCR was relatively quick, likely occurring over less than a century. The exact reasons for abandonment are not entirely clear but appear to be linked to climate change. A radiocarbon simulation experiment indicates that future robust radiocarbon dating with well selected samples could greatly improve the chronological precision for this late Mississippian activity.

**[315]** *Discussant*

**Kruse, Andrea (University of Nebraska- Lincoln)**

**[238]** *Digital History and Storytelling through Routt National Forest Past and Present Photographs*

Archaeology is changing from the data collection and specialized publishing to gaining deeper knowledge from past collections and sharing them to the wider public. Digital archives are now easily accessible with open source tools and the internet, which allows not only for collaboration with other researchers outside their agencies but engages a larger public with cultural heritage. This poster describes a digital archaeology project that uses historical photographs to engage and inform the public about the Routt National Forest in Northwest Colorado. It presents the methods used to digitally archive historical materials as well as employ these materials in diverse ways in digital exhibits that include mapping and multi-media. The multiple layers of information allow the public to explore Routt in order to learn about the early years of the forest and changes in forest structure, get digital access to restricted or inaccessible sites, as well as help plan their next trip to the forest. By digitally archiving photographs and using digital tools, Forest Service employees and the public can gain a new perspective on the past landscape areas they are studying for present-day heritage projects.

Kryder-Reid, Elizabeth [166] see Wilson, Jeremy

**Kuboyama, Waka (Universidad de Waseda)**

**[6]** *Crafting Process and Usage of "Axe-God" Jade Pendants in Pre-Columbian Costa Rica*

The "axe-god" jade pendants form the majority of Costa Rican jade artifacts. These pendants were valued for their "celt like shape" and did not function as real axes. Interestingly, some pendants do have abrasions on their axe edges. Because of that, it has been proposed that prior to being reworked into a corporal accessory, some of these pendants had been used as real axes or other tools. The "axe-god" pendants consist of two parts; the superior part with decoration of human or animals, and the inferior part presents undecorated axe. This unique shape of "axe-god" is also can be seen in gold, bone, and shell artifacts in Costa Rica. Hence, the inferior part of the axe pendants may have important symbolic meaning, and focusing on the axe part is of great significance. Both the crafting procedures and the basic form from which the pendant is shaped are closely related to the pendants

usage. In this study, a digital microscope was used to analyze use-wear and crafting techniques. As a result, I show that there were several ways to elaborate the "axe-god" possibly reflecting a variety of crafting groups.

Kuchelmann, Christian [34] see Cakirlar, Canan

Kuester, Falko [134] see Lo, Eric

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**Kuhn, Steven (University of Arizona)**  
[227] *Discussant*

**Kuijt, Ian (University of Notre Dame)**  
[4] *Material Geographies of Multi-family Neolithic Households*

This paper explores how people within Neolithic villages were potentially connected to co-resident multi-family households, and considers the potential material footprint of multi-family households within Neolithic villages. As seen from ethnographic cases, in some cases residential buildings of House Societies had a range of functions including as dwelling locations, origin-places, council houses, or meeting-houses. Echoing other research this paper decouples the social unit of the House from a single residence, and explores the case study of Çatalhöyük, in which the House can be modeled as linking multiple residential building. This paper provides insight into how members of Neolithic house societies appear to have used different building, rooms and / or spaces, in different ways. I argue that among house societies where people resided in a complex of buildings, select houses were invested with greater symbolism, were actively maintained as a means of perpetuating the House. Study of Çatalhöyük burial practices demonstrate that the living physically moved deceased household members from specific buildings / rooms where they slept, worked, and eat food, to pre-identified rooms at death.

Kuijt, Ian [296] see Donaruma, William

**Kulick, Rachel (University of Toronto)**  
[146] *An Urban Micromorphological Perspective on Neopalatial Environmental Changes at Bronze Age Palaikastro, Crete*

Transitional phases between settlement periods on Bronze Age Crete are often associated with 'natural' destructive events. However, it is unclear whether these 'natural' destructive events and subsequent shifts in material practices were influenced by anthropogenic or environmental processes. For example, the end of the Neopalatial period on Crete occurred in the LM IB period; some researchers view LM IB destructive fires as indicative of human action during a phase of social and political instability, while others reason that destructive fires followed a massive natural disaster. Micromorphological evidence from archaeological sequences can correspond to occupational and transitional phases and provide information on transformations in the surrounding environment, creating a microecological narrative. These narratives can distill social responses to environmental stresses from the archaeological record. New micromorphological evidence from the 2013–2015 Palace and Landscape at Palaikastro excavations, from the previously unknown neighborhood on the southeast edge of the main Bronze Age town, identifies some of these socio-natural responses. Micromorphological evidence from this neighborhood of three newly-excavated buildings illustrates variations in site formation processes and establishes a local, microecological narrative for the Neopalatial (MM IIIA—LM IB) period and associated transitional periods, which may be connected to larger regional and Mediterranean narratives.

**Kuma, Dela**  
[32] *Foodways in Atlantic Era West Africa—Ghana: Towards an Archaeology of Daily Life*

In the context of Africa, foodways are usually portrayed very differently than in the archaeology of food literature. Food in West Africa is depicted by its primary historians as shrouded in continuous food insecurities and largely lacking differentiated cuisines. However, recent archaeological and historical research in Atlantic era West African foodways have highlighted the dynamic nature of West African foodways. Despite these advancement, the full processes through which American crops became integrated into local African foodways is poorly understood. This paper critically reviews how Africanist researchers have discussed the incorporation of American crops into local foodways. Building on these works, I show how we can trace the impacts of local food choices on the broader Atlantic trade through my proposed ethno-archaeological research in Ghana-Amedeka. This paper situates these issues within the Atlantic era in West Africa. The Atlantic trade brought with it networks of connections and change, however these interactions did not happen in vacuum. They occurred within local situated social, political, economic, and historical contexts. I argue throughout this paper that the silence on these local social processes that shaped the contours of the Atlantic trade portray the multidirectional relationship that characterized the trade as unidirectional.

Kuma, Dela [220] see Logan, Amanda

Kurashina, Hiro [13] see Gilmore, Kevin P.

Kurin, Danielle [270] see Black, Valda

Kurin, Danielle [270] see Serra, Margot

**Kurnick, Sarah (University of Colorado Boulder)**  
[85] *Political Authority and the Creation of Wilderness: American National Parks and Mexican Eco-Archaeological Parks*

Over the last several decades, scholars have reexamined the importance of spatiality to human life and argued that space is social, relational, and that it produces and is produced by social relationships. This reconceptualization of space has highlighted the ways in which the production of landscapes is integral to the creation, maintenance, and negation of social inequality and political authority. Recent archaeological approaches to studying inequality through landscape have taken a variety of forms, including analyses of political architectonics, panoptic spaces, and pre-existing places. An equally important practice includes transforming, or claiming to transform, wilderness into a built environment. Such claims affirm rulers' abilities to impose order on chaos and to control the natural, or seemingly natural, world by destroying it. This presentation argues that political leaders bolster their authority not only by proclaiming their ability to turn wildernesses into built environments, but also by emphasizing their ability to turn built environments into wildernesses. Put differently, political regimes not only claim to conquer nature; they also claim to create it. To examine this argument, the presentation will compare the creation and development of American National Parks and Mexican eco-archaeological parks, focusing on the relationships between governmental authorities and indigenous peoples.

**Kus, Susan (Rhodes College) and Victor Raharijaona (Chercheur Associé, Université de Fianarantsoa, Mad)**

[181] *The "Private(s)" Is(Are) Political: Girding One's Loins for Work, for Battle, for Provocation, and Ungirding for Insurgence*  
Many societies archaeologists seek to understand are societies of primary orality. They are "lifeworlds" of primary subsistence. Their study demands a multiplicity of approaches. Certainly one needs a sensitive yet hardy material gaze (and touch). Further, one should seek sensuous engagement in subsistence and celebration. Additionally, one should cultivate an incitement to imagine how the poetic and philosophical, of both reflective thought and of speech, are anchored in the material experiences of the quotidian and the exceptional. Engaging in the challenges announced above, we discuss the Malagasy loincloth/salaka not only as an icon, index and symbol, but also as "matter" that mattered in the state politics of the Malagasy highlands. The salaka serves/ed as an icon of masculinity and of legitimate claim to rule, and as an Index of age, nobility, and "shame". It further served as a political symbol of incitement to competitive engagement. Yet, it also served as physical

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material in rebellion against imposed political authority and consequently as a symbol of cleverness/ruse in such contestation. Our discussion draws on archaeological evidence and recorded oral traditions from the time of 18th century “state” formation in central Madagascar, and from recent ethnoarchaeological fieldwork in the central highlands of Madagascar.

Kuypers, Martijn [92] see Bradshaw, Ryan

**Kvetina, Petr (Institute of Archaeology Prague, Czech Republic) and Jiri Unger (Institute of Archaeology Prague, Czech Republic)**

**[118]** *The Fast and the Furious. Innovations in Archaeological Visualisations at the Beginning of the 21st Ct.*

The aim of the paper is to discuss current possibilities of complex approach to 3D virtual presentation of archaeological information, both to public and professional archaeologists. Virtual archaeology including 3D objects, reconstruction of building structures and even past landscape scenes has been for several years a standard and specific way of documentation and interpretation. However, what is currently changing is the general availability of the necessary technologies. A common feature of new software solutions and new technological equipment is their high user-friendliness, which allows high-quality outputs without deeper knowledge of the issue or prior extended training. Another new important aspect is the low acquisition price of the software and equipment as compared to the previous period; moreover, many freeware tools have been created. Last but not least, there are new platforms for easy presentation and sharing of virtual data. In our talk, we will provide an overview of options for using the new 3D technologies especially for small heritage actors.

**Kwan, Daniel (University of Toronto)**

**[284]** *An Overview of Technological Changes in the Pottery of the Early Holocene Shangshan Culture, Zhejiang Province, China*

This presentation provides a preliminary overview of the diachronic modifications that occurred in the Shangshan ceramic technological tradition (approximately 11,400 to 8,600 cal. BP). It is hypothesized that Shangshan peoples engaged in low-level cultivation of rice and began the process of bringing this crucial cereal under domestication. The authors explore the relationship between changes in Shangshan pottery technology, culinary practices, and the emergence of rice cultivation as factors in the complex human-environmental interaction that occurred in the lower Yangtze Valley after 12,000 years ago. Pottery recovered from the Shangshan, Hehuashan, Huxi, Qiaotou, Miaoshan, and Changchengli sites serves as the focal point for the macroscopic component of analysis.

**[61]** *Discussant*

Kwan, Daniel [87] see Dorland, Steven

Kwoka, Jopshua [173] see Guderjan, Thomas

La Rosa, Vanessa [64] see Shoji, Kazuho

**Labadia, Catherine (Connecticut SHPO)**

**[203]** *The Connecticut State Archaeological Preserve Program*

In this introduction to Connecticut’s State Archaeological Preserve program, I will talk about the legislation that created it, the process for designating sites as Archaeological Preserves, and how these properties are used or managed after designation. Although the program has the explicit goal of site preservation, in practice it has spurred many additional benefits. Foremost among these additional benefits has been the forging of partnerships with the State Historic Preservation Office and inspiring stewardship for the sites so designated. While not every nominated site makes it to preserve status, just going through the process for consideration has made the value of these benefits more apparent to all involved. Nominations for archaeological preserve status have originated from a variety of concerned preservation groups, individual landowners, municipalities, state agencies, or at the request of SHPO. Many of the individuals or groups that have sought designation have not been traditional partners with SHPO’s archaeology program. More importantly, these individuals and groups have developed their own sense of stewardship over resources they cannot see, and has fostered a sense of stewardship in their communities.

**[159]** *Discussant*

**[203]** *Chair*

**LaBelle, Jason (Colorado State University) and Kelton Meyer (Colorado State University)**

**[174]** *Passing Through or Settling Down? Paleoindian Occupation of Colorado’s Southern Rocky Mountains, USA*

Colorado is well known for dense concentrations of Paleoindian sites found within its eastern plains and in multiple high altitude basins (Middle Park, Gunnison Basin, San Luis Valley) to the west. Prominent mountain ranges separate these clusters of sites, and the question remains, when were these mountains first crossed and/or utilized? These high altitude settings (elevations routinely topping 3000–4400 m) would have presented both challenges and opportunities for the earliest inhabitants of the region. This paper examines the occurrence and frequency of Paleoindian components within the montane, subalpine, and alpine ecosystems of the Front Range and the Medicine Bow Range of the Southern Rocky Mountains. Over 750 sites of all periods (276 prehistoric components) are recorded over an area encompassing seven 1:24,000 scale maps. While limited numbers of late Pleistocene materials are present (faunal remains, Folsom materials), these ranges are dominated by late Paleoindian occupations, found at Early Holocene Allen complex sites such as Carey Lake, Caribou Lake, Fourth of July Valley, and Rollins Pass. Archaeological data are summarized to discuss the timing of the initial occupation of these high mountains, identify the periods of most intensive Paleoindian use, and propose reasons for these early occupations.

LaBelle, Jason [127] see Meyer, Kelton

**Ladefoged, Thegn (University of Auckland), Dion O’Neale (University of Auckland), Alex Jorgensen (University of Auckland), Christopher Stevenson (Virginia Commonwealth University) and Mark McCoy (Southern Methodist University)**

**[20]** *The Dynamics of Māori Socio-political Interaction: Social Network Analyses of Obsidian Circulation in Northland Aotearoa*

The Polynesian colonists who settled New Zealand touched off the creation of a type of society not found in remote Oceania. Over the span of several centuries relatively autonomous village-based groups transformed into larger territorial hapū lineages, which later formed even larger geo-political iwi associations. A social network analysis of the spatial and temporal distribution of obsidian artefacts, an important stone resource that was used for a variety of tools, evaluates where and when new types of social forms came about in relation to diverse social and environmental contexts. Incorporating data from pXRF sourcing of obsidian artefacts and obsidian hydration dating we investigate the dynamic complexities of social interaction in Northland and gain insights into how Māori society was transformed from village-based groups to powerful hapū and iwi.

**[20]** *Chair*



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**Ladron De Guevara, Sara (Sara Ladron de Guevara)****[128]** *The Eyes of God*

The deities of El Tajin seem to share a characteristic scroll eyebrow in bas reliefs as well as in mural paintings.

I will follow the representation of such an icon, trying to recognize possible origins, the outreach of the element and the symbolic associations in Mesoamerican time and space.

**Laffoon, Jason (Leiden University) and William Pestle (University of Miami)****[323]** *Quantitative Paleodietary Reconstruction with Complex Foodwebs: An Isotopic Case Study from the Caribbean*

Stable isotope analysis is one of the most effective tools for paleodietary reconstruction and has been widely applied to a vast array of archaeological contexts including the Caribbean region. This region, however, possesses a particularly complex isotopic ecology, including both a large number of isotopically variable food sources and a high degree of isotopic overlap between different food groups. As such, to date, most regional paleodietary studies have been limited to descriptive and qualitative conclusions concerning the relative contributions of different food sources. In this study we apply an iterative Bayesian multi-source mixing model (FRUITS) to human stable isotope data from the prehistoric population of Tutu, St. Thomas, USVI, to generate quantitative and probabilistic individual paleodietary reconstructions. The isotope dataset includes both bone collagen ( $\delta^{13}\text{C}_{\text{co}}$  and  $\delta^{15}\text{N}_{\text{co}}$ ) and apatite ( $\delta^{13}\text{C}_{\text{ap}}$ ) data. The results of two different dietary models using four and five distinct food groupings, respectively, are compared and assessed relative to other relevant archaeological evidence concerning past diet at the site. We highlight the potentials and limitations of multi-source mixing models for regional paleodietary studies, and their relevance to ongoing debates within Caribbean archaeology concerning the relative importance of different food sources such as manioc, maize, and seafood.

**Lagia, Anna (Biological Anthropology, Albert-Ludwigs-University Freiburg)****[298]** *Contributing Bodies: The Foundation of the Modern Human Skeletal Collection of the University of Athens in Greece*

The capacity of humans to contribute positively even long after death includes not only donations and institutions but also one's own body. The human body and its parts provide the opportunity to bridge time in archaeological and forensic contexts and appreciate human history. In 1996–7 this capacity was aptly evaluated by the scientific committee of the Wiener Laboratory of the American School of Classical Studies in Athens and the foundation of the modern human skeletal reference collection for Greek populations was launched. Since then, a large number of contributions has led to the creation of a collection of more than 350 human skeletons at the University of Athens, known as the 'Athens Collection.' Fields of research involving the determination of sex, age, health and diet draw now directly from a collection of human remains for which these parameters are known. Today anthropology practiced in Greece and the Eastern Mediterranean has its own coordinates and sound foundations. In this presentation an appraisal is attempted of the course and dynamic of the development of this collection, known during its foundation as the 'Wiener Collection.'

Lakevold, Courtney [120] see Ives, John W.

**Laluk, Nicholas (White Mountain Apache Tribe)****[114]** *Embracing the Ndee Past as the Present: Ndee Cultural Tenets as Sovereignty-Driven Practice and Community Well-Being*

In 2004 the White Mountain Apache Tribe passed a tribal resolution approving the White Mountain Apache Tribe Cultural Heritage Resources Best Management Practices (Welch et al.). These practices presented and delineated in guideline form discuss cultural heritage resource definitions; management and necessary steps before, during and after project implementation for any ground disturbing projects potentially adversely affecting cultural heritage resources on Ndee (Apache) trust lands. However, since the tribe's adoption of the practices little has been done in reference to the application of such tenets/concepts found within the guidelines to real world cultural and archaeological methods and practices. Moreover, diversity at the tribal community level during oral collaborative interviews demonstrates that tribal knowledge systems that drive such best management practices and overall sovereignty-driven research need to be considered as directly affecting how these practices might be applied at both the intra- and intertribal level. This paper suggests that such cultural precepts including respect and avoidance can be used and applied to Ndee research contexts that not only embrace such cultural tenets, but contribute to overall community well-being as well as a sense of balance, beauty and harmony known as Gozho for Western Apache communities.

**Lam, WengCheong (Chinese University of Hong Kong Department of Anthropology)****[24]** *Early Globalization of the Han Empire in Its Southern Frontier and the Expansion of Iron Economic Network*

Even though the framework of early globalization has been proved as effective in illuminating ancient interregional interaction in many regions, its value and contribution to the archaeological study of ancient China has been overlooked in the literature. Focusing on the Han Empire, we employed statistical methods to exam variations in assemblages and frequencies of iron objects, one type of critical state finance in the Han political economies, from burials in the southern frontier of the Empire, including present-day Hunan, Jianxi, Fujian, Guangdong, and Guangxi. Although iron ware was commodities commonly found in the Han period, this study identified several cross-regional patterns of variation in the assemblages of iron ware from tombs, which were shaped by both local production, expansion of the imperial market network, and core-periphery relationship. By combing globalization framework and analysis of our big data, this presentation tries to shed new light on nature of integration and regional interaction of the Han Empire.

**Lamb, Céline (University of Kentucky)****[142]** *Crafting, Ritual, and the Constitution of Rural Complexity: Household and Community Practices of Distinction and Affiliation at Chunhuayum, Yucatán*

As Maya archaeology has shifted away from urban-centric perspectives, recent research demonstrates that hinterland populations, like urbanites, were involved in diverse and shifting practices enabling them to build and negotiate complex relationships. Using a community approach, this paper examines non-agrarian activities practiced during the late Early and Late Classic (ca. 500–850 AD) by residents of Chunhuayum, a small yet socioeconomically diverse farming settlement located in northwest Yucatan. Through domestic assemblages and architecture, I argue that shell and chert craft production, and suprahousehold rituals, enabled three households to distinguish themselves more markedly from their neighbors while simultaneously partaking in the constitution of a local community. These activities, and their resulting relations of mutually constituting affiliation and distinction, are also related to nearby centers' faltering political clout and population decline. Reframing discussions of complexity to focus on the micro-levels of human interaction within a lower-order rural settlement, this research counters enduring assumptions about rural populations and contributes to a more inclusive and nuanced understanding of ancient Maya social complexity, in which hinterland people were diverse, active participants in local and regional historical processes.

**[142]** *Chair*

**Lamb, Henry (Aberystwyth University, UK)****[198]** *The African Humid Period: Paleolimnological and Paleoecological Evidence*

From about 15,000 to 5,000 years ago, lakes and rivers existed across now arid areas of northern Africa, accompanied by extended ranges of vegetation, animals and human settlement. In eastern Africa, lake levels were very much higher than present, with now-closed lakes overflowing into

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the Nile and tributary rivers. While it is widely recognised that this African Humid Period resulted from an intensified African summer monsoon linked to the early Holocene precessional increase in summer insolation, its precise timing and geographical extent, especially its onset and termination, are widely debated. Vegetation feedback factors may account for differences in the rate of changes between insolation drivers and climatic response. Local factors, especially lake hydrology and morphology, undoubtedly account for differences in the timing of changes between sites. In this contribution, I will review some of the evidence for the African Humid Period, demonstrate these apparent anomalies, and attempt to clarify its temporal and geographical boundaries.

### Lamb, Trevor (University of New Brunswick)

**[199]** *Incised Lines: Mortuary Ceramics and Their Role in Defining Protohistoric Chronologies in the Far Northeast 1900–1960*

The first half of the twentieth century saw the creation of many professional and avocational archaeological institutions in Eastern Massachusetts. These institutions were motivated to both understand the prehistory of the Northeast, and to build large museum collections for comparative and public engagement purposes. The drive to acquire largely intact objects led to the excavation of many graves throughout New England and the Maritime Provinces, but the frequent discovery of graves in Eastern Massachusetts due to urban expansion led to their heavy representation within the literature. A large body of incised ceramic vessels from grave contexts thus entered institutional collections during this period, and formed the core of what scholars and avocationalists used to define Protohistoric ceramic technology. This paper seeks to evaluate the persistence of these chronologies in the twentieth century, address later research which demonstrates the inappropriateness of applying these chronologies to much of the Far Northeast due to the contemporaneous use of cord impressed ceramics in areas of Maine and the Maritimes, and to serve as a starting point for future research concerning ceramic diversity in the Protohistoric Far Northeast.

### Lambert, Shawn (University of Oklahoma)

**[255]** *A Provenance and Stylistic Study of Formative Caddo Vessels: Evidence for Specialized Ritual Craft Production and Long-Distance Exchange*

Instrumental Neutron Activation Analysis is used to determine whether Formative Caddo finewares (A.D. 850 -1150) were made locally in the Arkansas River Basin or produced by their Gulf Coastal Plain neighbors to the south. The preliminary INAA results, in concert with a stylistic study that indicates very few potters had the knowledge and skill to produce them, show that Formative Caddo finewares were made in the southern Caddo region and exported north to Arkansas River Basin mound centers for strictly mortuary use. These findings suggest an extensive history of specialized ritual production and long-distance exchange between two diverse Caddo communities much earlier than expected.

### Lambert, Spencer (Brigham Young University)

**[43]** *Identifying Fremont Large Game Hunting Practices through the Modified General Utility Index and Strontium Isotope Analysis*

The analysis of faunal bones from several Fremont sites have resulted in complications when compared to the Modified General Utility Index (MGUI). In this research, I explore the processing and transportation techniques of Fremont hunters at Wolf Village by comparing skeletal frequencies to the MGUI. Then, I compare these frequencies with results of strontium isotope analysis on small artiodactyl teeth from Wolf Village to determine which species were obtained locally. I also identify the strontium baseline at Wolf Village and five other Fremont sites in order to identify evidence of trade between Fremont communities. The results of this research suggests that the MGUI does not seem appropriate for measuring the utility of animal portions by the Fremont. Reverse utility curves at several Fremont sites suggest that the Fremont were regularly bringing low utility elements back to residential sites at least part of the time. The MGUI can only consider caloric reasons for prehistoric hunters to return to habitation sites with low utility elements. Only when considering the social and economic reasons for transporting so-called low utility elements can archaeologists begin to discover the reasons behind the processing and transportation techniques of Fremont hunters.

Lambert, Spencer [10] see Bryce, Joseph

### Lamothe, Francis (Ethnoscop), Karine Tache (CUNY Queens College) and Roland Tremblay (Consultant)

**[225]** *Human Presence and Intersocietal Interactions in the Laurentians (Quebec, Canada)*

The Laurentians is a region of rolling hills, mountains and lakes occupying a strategic position in the vast hydrographic basin that drains the northern shore of the Saint Lawrence River. Archaeological fieldwork undertaken since 2015 demonstrates the integration of this landscape within interaction networks encompassing several other regions of the greater Northeast at various time periods. Ceramic remains, notably, reveal close links between Algonquians of the Laurentians and both Hurons to the west and Saint Lawrence Iroquoians to the south. Ongoing analysis of organic residues preserved in these vessels will further document how such artifacts were integrated and used in the Laurentian landscape. Artifacts associated with the Fur Trade, on the other hand, illustrate commercial relationships that bonded Algonquin and their French allies at the beginning of the 17th century. By means of documentary sources and archaeological data, this poster draws a picture of the Laurentians, a landscape on which small nomadic groups inscribed their presence, interacted, and created social memories for over 5000 years.

LaMotta, Vincent M. [218] see Hedquist, Saul

### Lamoureux St-Hilaire, Maxime (Tulane University)

**[337]** *An Empirical Study of the Economy of the Classic Maya Regal Palace of La Corona, Guatemala*

This paper reports on the final results of a multi-faceted study of the northern section of the regal palace of La Corona. This study sampled (n=328) both plaster and soil in three adjacent patios and adjoining middens. The plaster samples underwent a geochemical analysis (ICP-MS), while the soil samples underwent flotation analysis which recovered macro-botanical remains and micro-artifacts. These results were then combined to traditional artifactual data derived from five middens excavated within the sampled area. The combination of these datasets reveals invaluable information about the economic activities that occurred in the regal palace during its latest phase of occupation, spanning roughly 750–850 A.D. These activities included: food preparation; the manufacture of many different lithic, ceramic, and perishable artifacts; the combustion of various materials; the preparation of pigments; the storage of perishable and durable items; and the discard of every type of artifact. The results of this NSF-funded study inform on the pragmatic dimensions of the political-economy of the ancient institution that was the La Corona Regal palace.

Lamoureux St-Hilaire, Maxime [337] see Morales Forte, Rubén

Lamoureux St-Hilaire, Maxime [147] see Snetsinger, Andrew

### Landa, Olga

**[158]** *La gestión y colaboración interinstitucional con la CFE y SCT para la protección del patrimonio arqueológico en Oaxaca*

La numerosa y acelerada construcción de infraestructura en México, suelen poner en riesgo la subsistencia de los vestigios arqueológicos ubicados a lo largo y ancho del territorio, los cuales deben ser salvaguardados, sin que esto signifique detener el desarrollo del país. En este sentido se planeó conjuntamente con la Comisión Federal de Electricidad y la Secretaría de Comunicaciones y Transportes, la instrumentación de mecanismos adecuados para que la realización de las obras sea planificada de manera que no afecte los vestigios de nuestro pasado y, en su defecto, el impacto

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sobre ellos sea menor, mostraremos los casos específicos de la introducción de los tendidos eléctricos y carreteras que están en gestión o construcción recientemente en Oaxaca y que han permitido registrar y conocer algunos sitios arqueológicos que no han sido investigados.

**Landau, Kristin (Alma College)**

[82] *The Dynamics of State Integration: A Neighborhood Perspective from San Lucas, Copán, Honduras*

In the early 2000s, Mesoamerican archaeologists adopted the “dynamic” model of state organization, positing that political centralization strengthened and diminished over time. Such fluctuations are due primarily to the inherent tension between the institutions of kinship and kingship, and consequent struggle for power in political, economic, and religious spheres. I argue that the intermediate scale of the neighborhood is best suited for analyzing how local- and state-level power structures intermix on the ground. Neighborhoods within cities capture both the everyday life of a diversity of residents, and articulate with larger state institutions and political economy. While the dynamic model is now widely accepted, very few studies show how state actors and local people actually navigate growing and waning power levels. I model such dynamics through the lens of Collective Action Theory, which specifically addresses the role of state actors in the everyday life of local residents through the concept of infrastructural power. I provide a case study illustrating the actions of San Lucas residents and the Copán state during moments of very high and very low infrastructural power. This perspective provides a more holistic understanding of ancient state organization.

Landivar, Tamara [324] see Ordoñez, Maria

Landsman, Andrew [202] see Kelly, Sophia

**Lane, Amanda (Rhodes College), Katherine Cynkar (Rhodes College), Kimberly Kasper (Rhodes College) and Anthony Graesch (Connecticut College)**

[153] *What's In a Seed?: An Experimental Archaeological Study of Elderberry (Sambucus sp.) Processing on the Pacific Northwest Coast*

Uncharred botanicals are commonly found on archaeological sites but seldom assigned interpretive significance owing to their assumed ambiguous origins. Thousands of uncharred, fragmented *Sambucus racemosa* (red elderberry) seeds have been recovered at Welqámex, a Stó:lō-Coast Salish settlement in the Upper Fraser Valley of southwestern British Columbia. In Stó:lō-Coast Salish territory and beyond, *Sambucus* was used as both a food and a medicine. Owing to the presence of cyanide-like glycosides, uncharred elderberry seeds are seemingly preserved in archaeological deposits for well over a hundred years. This poster highlights archaeological and experimental archaeological research addressing the stratigraphic and taphonomic circumstances under which unburned seeds can be linked to food-processing activities. We present the results of five experiments in which elderberry fruit was subjected to different preparation and cooking techniques.

**Lane, Kevin (CONICET—Instituto de Arqueología)**

[275] *When the Saints Come Marching In: Colony, Church and Change in the Andes (1480–1615)*

Spanish conquest of the Andes commenced in 1532 and, for all intents and purposes, was over by 1572. Yet, this somewhat simplifies the story. Throughout the Andean region, but especially away from the early strongholds of Spanish power, such as the towns and cities, conquest was a mixture of appropriation and negotiation. Drawing on research from the Ica Highlands (South-central Peru) and the Cordillera Negra (North-central Peru) this paper examines how Spanish religious orders initially occupied sacred indigenous sites, linking them directly to local cosmological landscapes. With time, the contradiction between an externalized (Andean—animated landscape) and an internalized (Christian—church) system of worship amid growing Spanish hegemony called for a renegotiation of this earlier *modus operandi*. In turn, this led to the abandonment of early church sites, in favor of churches in new town reducciones—imperial settlements which concentrated a declining indigenous population in more accessible areas—that led to a disconnect with the earlier Andean landscape. Nevertheless, the resulting Andean church was always syncretic, for instance, combining Christian saints with Andean deities, and local pilgrimage routes that directly evoked earlier indigenous sacred sites. Here we analyze the changing nature of this emergent syncretism.

[207] *Discussant*

[207] *Chair*

Lane, Kevin [224] see Whitlock, Bethany

**Lane, Rachael (University of Sydney), Sarah Lane (Arizona State University) and Ruby Kerwin (Arizona State University)**

[307] *Parting the Sea and Draining the Swamp: A Critical Review of Binary Approaches to Water Management*

Archaeology has the unique ability to observe how past societies' water systems were organized and managed. Indigenous approaches to water management in pre-colonialist societies, in both a conceptual and practical sense, often differed largely from those of their colonizers. Through three case studies, we evaluate and contrast indigenous relationships with water and those imposed by colonial powers. These case studies include the draining of lake of Texcoco by the Spanish in modern day Mexico city, modern development in Siem Reap, Cambodia, and the construction of the Aswan Dam to control the floods of the Nile river. We contend that decision making parties on water management in these contemporary cities have problematically based decisions for the organization and management of their water system on binary models of seasonality (i.e., wetlands/drylands). We find that a strict adherent to dichotomous treatments of water management may reduce the productive capacity of water management systems. A more faithful interpretation of indigenous approaches to water systems in these three cases may have led to a different outcome of improved productive capacity.

**Lange, Frederick (Smithsonian Institution Department of Anthropology)**

[263] *Exploring Mobility and Multi-directional Lifeways in Pre-Columbian Central America*

To paraphrase the symposium organizers, for decades changes in the pre-Columbian material culture of Central America were attributed to either migration or conquest. When I began archaeological research in Costa Rica in 1969 the endless debate was about Mesoamerican influence. Technological and iconographic linkages were frequently cited, but rarely were the mechanisms of the proposed linkages adequately defined or demonstrated archaeologically. In 2008, perhaps unduly influenced by having moved to California in 2004, I floated the concept of a “southern Mesoamerican Wedge” a la Kroeber. This wedge paralleled the Pacific coast and while the Paleo and Archaic periods were almost invisible, by the early Preclassic almost identical ceramics are found in the Soconusco, beneath downtown Managua, and in the Arenal region of Costa Rica. And, in a pattern even more complicated than was ever described for the Taki Wedge, the southern Mesoamerican Wedge is also intersected throughout Central America with river drainages that for all intent and purpose connected the Caribbean with the Pacific and low, natural “roads” or “saddles” between the volcanoes that accomplished the same objective. Investigating these complex adaptations, particularly involving groups of differing linguistic or ethnic backgrounds, requires new research designs and multi-country research.

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**Lange, Richard (Arizona State Museum, University of Arizona)**

**[131]** *The Southwest Journeys of Adolph F. Bandelier, Charles H. Lange, Elizabeth M. Lange, and Carroll L. Riley*

The US Southwest has attracted numerous adventurers and researchers since the mid-19th Century, including the three individuals noted in the title. Although more than 60 years passed between their respective journeys, their approaches to understanding native Southwest cultures were remarkably similar. Their work melded data and insights from ethnology, anthropology, history and historical documents, and archaeology. The later researchers could not have known when they began their journeys that telling the story of the earlier researcher would become a shared project that consumed much of their professional lives. That process took more than twice as long as the original researcher was in the field in the Southwest. This paper reviews the enduring legacies of these scholars and the circumstances that surrounded their efforts.

**[218]** *Discussant*

Langebaek, Carl [66] see Miller, Melanie

**Langlie, BrieAnna (Binghamton University)**

**[254]** *Gardening for Victory: War Gardens in the Ancient Andes*

During times of social and political crisis humans' most basic biological needs still need to be met: they need to eat. This means that during times of war, when state infrastructure breaks down and supply chains are threatened, people often take food security matters into their own hands. During 20th century conflicts, families ensured food security on the home front by building household gardens. Practically, the construction of war gardens resulted in decreased individual reliance on often fragile political systems and infrastructure. While this process could be viewed as isolating, families often viewed themselves as collectively contributing to the war effort by maintaining self-sufficiency. In this paper, I will look at historical examples of war gardens and victory gardens to assess how they provided an anchor of cultural continuity at the household level while at the same time altering broader demographic, economic, and political relationships. I will then use these data as a heuristic framework to consider how pre-Hispanic gardens transformed social relationships in the Peruvian Andes during times of war.

**Langlitz, Meredith (Archaeological Institute of America)**

**[233]** *Discussant*

Langlitz, Meredith [222] see Perez-Juez, Amalia

Lanoe, Francois [153] see Zedeño, Maria Nieves

**Lanza, Christopher, Amanuel Beyin (University of Louisville) and Erik R. Otárola-Castillo (Purdue University)**

**[103]** *Which Way Did They Go? Using Individual-Based Models to Identify Out of Africa Hominin Dispersal Routes*

There is a broad paleoanthropological consensus that hominins left Africa multiple times during the Pleistocene, but the geographic routes through which they exited the continent remains unclear. Although the Sinai Land Bridge and the Strait of Bab-al-Mandab on the southern end of the Red Sea are commonly implicated as the likely pathways used by early humans during their expansion out of Africa, the evidence supporting each route is still much debated. Here, we identify viable pathways for hominin dispersal from the Ethiopian-Afar basin toward the Sinai using Individual-Based Modeling (IBM) and computational statistics. We computed empirical probabilities for modern hunter-gatherers to occupy habitats with variable elevations, slopes, streamflow and Net Primary Productivities to input into our IBM. Results show that hominins could have followed multiple paths during their expansion out of the Ethiopian-Afar rift basins toward the Levant, including the western littoral of the Red Sea basin. This study sheds light on the geographic areas that may have facilitated hominin dispersal out of Africa, and lends support to the notion that coastal landscapes may have served as dispersal conduits during global expansion of hominins. Furthermore, the models identify key target areas for future survey.

Laparidou, Sofia [298] see McNamee, Calla

**Lapham, Heather (UNC Chapel Hill), Gary M. Feinman (Field Museum of Natural History) and Linda M. Nicholas (Field Museum of Natural History)**

**[43]** *Raising Dogs for Meat and Sacrifice: A Comparative Study of Classic Period Sites in Oaxaca, Mexico*

The domestic dog (*Canis familiaris*) became a staple in the meat diet of Zapotec peoples during the Formative period (1500 BC—AD 200) in the Valley of Oaxaca, Mexico, and continued to be increasingly important in subsistence and ritual into the Classic and Postclassic periods. Recent zooarchaeological research has identified low-intensity household management/production of animals and animal by-products at sites throughout the valley, with each settlement marked by its own unique signature of animal use. Households within each community also showed differences, both marked and subtle, in animal-based subsistence practices, dietary preferences, and use of animals and animal by-products. Drawing on data from dog skeletal remains and ceramic dog figurines, we examine dog raising, consumption, and use at the Classic period site of Lambityeco. We compare similarities and differences among households at Lambityeco and two other contemporaneous sites (El Palmillo and the Mitla Fortress) to gain a more holistic understanding of dogs in ancient Zapotec foodways, ritual practices, and craft activities.

LaPoint, Halcyon [48] see Lee, Craig

**Lapp, Jennifer E.**

**[148]** *Moderator*

**[148]** *Discussant*

**Larkin, Karin (University of Colorado at Colorado Springs) and Michelle Slaughter (Avalon Archaeology and Metcalf Archaeological Cons)**

**[39]** *Chasing the Cure: The Archaeology of Alternative Health Practices at a Tuberculosis Sanatorium*

Eighty years ago, Cragmor Sanatorium in Colorado Springs, Colorado was a celebrated asylum for wealthy tuberculars and one of the premier facilities in the West. In its heyday, Cragmor housed some of the wealthiest patients in the United States. In the 1950s, the sanatorium contracted with the Bureau of Indian Affairs to treat Navajo women with tuberculosis. Once it became part of the University of Colorado system in 1965, much of the original history was subsumed under the growing campus but a few features remain. This project seeks to recover some of the ephemeral features of the sanatorium that could help us put the history in context and better understand the alternative health practices employed by both patients and doctors at the sanatorium. As part of a survey and inventory of the cultural resources of UCCS funded by the Colorado State Historic Fund, we identified and recorded several sites associated with the original functioning of the sanatorium. Using archaeological testing and historical records, we illuminate institutional practices as well as describe alternative healing strategies employed by physicians and patients at Cragmor.

**[39]** *Chair*

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**Larmon, Jean (University of Illinois at Urbana-Champaign) and Lisa Lucero (University of Illinois at Urbana-Champaign)**

**[85]** *Cara Blanca Pool 6: Colonial Logging and the Evolving Landscape*

Cara Blanca, in central Belize, consists of 25 pools that run east to west along the base of a limestone cliff. The Pre-Colombian significance of the pools has been studied by the Valley of Peace Archaeology Project, yet little attention has been paid to their Post-Contact influence on the local and regional landscape. This paper explores the role that Pool 6, a shallow lake centrally located in the line of lakes and cenotes, played in colonial logging operations around Cara Blanca. The 2014 exploration of Pool 6 revealed equipment used in logging, as well as historic alterations to the landscape that facilitated the movement of hardwoods from inland towards the coast. While this presentation focuses on Post-Contact logging, its theoretical emphasis is on the resilient yet malleable nature of evolving landscapes. Through a relational perspective, archaeological sites lose the label of “in the past” and, rather, reveal their ever-developing life histories. Cara Blanca Pool 6 and surrounding features exemplify how a space—a landscape—can transform while retaining the core of its essence, tying together past and present.

**Larsen, Eric**

**[53]** *“So, have you tried...?”: Is It REALLY about Science... Or Is It about Authority?*

Some archaeologists and other preservationists perceive a growing hostility in conversations about cultural heritage issues. At times it feels as though people are questioning the very foundations of archaeological work. Other times, it seems as though people just think you need to apply the technique they recently saw used on TV or the web (a la the “CSI Effect”). The implications can leave the archaeologists feeling as though the public don’t believe we know what we are doing or that they are otherwise belittling the work we do. The questions/confrontations can be quite maddening—along the lines of answering the multiple “found any gold yet?” inquiries that come up at public sites (I share with fellow archaeologists that this utterance is really a hackneyed expression of interest by the visitor). Is there something else behind the threat that many are experiencing? May we be seeing the results of a changed environment where visitors increasingly feel empowered to question the “authority” of the archaeologists? Confronting skepticism or parrying suggestions that imply we don’t know what we are doing can be difficult. This presentation will consider re-framing our responses toward further engaging interested visitors and potential supporters.

**Larson, Greger (University of Oxford), Laurent Frantz (University of Oxford), Angela Perri (Durham University), Ophelie Lebrasseur (University of Oxford) and James Haile (University of Oxford)**

**[212]** *Testing the Dual Origin Dog Domestication Hypothesis*

Despite numerous investigations leveraging both genetic and archaeological evidence, the geographic origins of dogs remain unknown. On the basis of an ancient Irish dog genome and an assessment of the spatiotemporal appearance of dogs in the archaeological record, a recent paper suggested that dogs may have been domesticated independently in Eastern and Western Eurasia from distinct wolf populations. Following those independent origins, a mitochondrial assessment suggested that the Mesolithic dog population in Western Europe may have been replaced by a population from the East. To test this hypothesis, we are generating nuclear genomes of ~10 Mesolithic dogs sampled from sites in Europe and Western and Eastern Russia, and mitochondrial genomes from ~400 dogs spanning the last 15,000 years across Eurasia. The results of this analysis will reveal the phylogenetic affinities of dogs that were present across the Old World prior to the introduction of dogs associated with farming communities. This study will also allow us to pinpoint the timing of the European mitochondrial turnover and to assess whether there was a commensurate turnover at the nuclear level, thus directly addressing whether dogs were domesticated from more than one population.

Larson, Mary Lou [127] see Kornfeld, Marcel

**Lash, Ryan (Northwestern University)**

**[309]** *Movement, Intersubjectivity, and Sensory Archaeology—Insights from Western Ireland*

Movement is fundamental to bodily perception and to the formation of the archaeological record. Histories of movement shape our perceptual apparatus and generate embodied knowledge. This recursive constitution of bodies, movements, and materials simultaneously defines the challenge and opportunity of phenomenological approaches within sensory archaeology. Explicitly or not, most researchers use their own bodily experiences of movement as analogies for making inferences about the material and sensory consequences of bodily movements in the past. As imitative learning produces shared embodied knowledge among craftspeople, likewise, archaeologists can engage with movements and materials to produce some degree of intersubjectivity with bodies in the past. Drawing from archaeological and ethnographic fieldwork in western Ireland, this paper will propose simple guiding premises for undertaking a sensory archaeology of movement. To illustrate these premises, I discuss the changing material settings and practices of Irish pilgrimage and pastoralism between the medieval and modern period. I contend that interdisciplinary, collaborative research can play a vital role in refining phenomenological research by placing researchers’ subjective experiences in dialogue with descent communities, communities of practice, and relevant historical texts and imagery.

**Laszcza, Aleksandra (University of Warsaw)**

**[17]** *Pre-Columbian Textiles from Castillo de Huarmey: Fabric Structures and Iconographic Motifs as Indicators of Cultural Influences*

Castillo de Huarmey on the north coast of Peru is an archaeological site of pre-Hispanic Middle Horizon period (AD 600–900), widely known for the discovery of the first undisturbed Wari royal mausoleum. From 2012–2013 remains of fifty-eight elite female individuals were found accompanied by rich ceremonial offerings and grave goods, including textiles. The state of preservation and the condition of a large portion of the fabrics are poor, especially those coming from the primary burial contexts. However, technological analyses revealed the unique character of the textile collection, which utilized multiple and complex weaving techniques. These techniques were applied by highly skilled weavers to create sophisticated iconographic motifs, and even though there are only a few decorated and completely preserved textiles, analyses of smaller fragments enabled the reconstruction of complete patterns. Comparison with fabrics discovered at the Castillo de Huarmey site before the first systematic excavations, as well as with motifs known from other archaeological contexts and collections, suggests strong cultural influences from the central and southern part of Peru.

**Latorre, Claudio (IEB & Departamento de Ecología, Pontificia Universidad Católica de Chile), Jacob Freeman (Anthropology Program, Utah State University, Logan), Erick Robinson (Department of Anthropology, University of Wyoming,), Eugenia M. Gayo (Center for the Study of Climate Change & Resilience) and Mauricio Lima (Departamento de Ecología & CAPES UC, Pontificia Un)**

**[105]** *PeoPLE 3K: Understanding the Population Dynamics of the Americas in the Context of Regional and Global Environmental Change*

From the civilizations in Easter Island to the Mayas or to the collapse of the prehistoric populations in the Great Basin, researchers have proposed a wide range of hypotheses to disentangle the causes and drivers behind such pronounced demographic change. PeoPLE (PaleoClimate and the PeoPLing of the Earth) 3K is a new working group recently created by Past Global Changes (PAGES) to examine in detail how environmental change over the last 3000 years has affected, either by facilitating population expansions or by promoting civilization collapse, past human demographic change. Our approach is to use a Socio-Ecological Systems (SES) approach to facilitate integration of population structural change (based on summed probability distribution curves created from archaeological databases) and past climate change impacts on the environment. Our approach further uses models developed by population ecologists to propose a new understanding of how climate and human population size interact through resource utilization over time. We illustrate these ideas with examples of population change and collapse from the high Andes, the Atacama Desert, the Great Basin and Easter Island.

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Latorre, Claudio [86] see Mcrostie, Virginia

**Lattanzi, Gregory (New Jersey State Museum)**

[328] *The Abbott Farm National Historic Landmark: A Look into the Future*

When the Abbott Farm site was listed as a National Historic Landmark in 1976, it had already been well-known for a hundred years as a significant archaeological site. Now over 40 years later, the Abbott Farm continues to baffle archaeological scholars as to the precise meaning of its importance to prehistoric and historic native peoples of the region. Past research, present trends, and future analysis are discussed providing a myriad of evidence showing that this site continues to provide and yield information important to the prehistory of the Middle Atlantic region. Specific topics to be addressed in this presentation include the future role of NAGPRA in relation to the Abbott Farm site; the usefulness of semi-destructive and non-destructive analysis on artifacts; and the role that the study of trade and exchange and mortuary practices plays in our understanding of social complexity and connected landscapes within the Middle Atlantic region and beyond.

[328] *Chair*

**Lau, George (Sainsbury Research Unit, UNIV OF EAST ANGLIA)**

[333] *Tello and Carrión Cachot on Recuay Culture: A Visual Archaeology*

While the achievements of the great Peruvianist Julio C. Tello and his theories about Andean civilisation are well-chronicled, much less work has addressed his engagements with archaeological illustration, its practices and desires, especially beyond his signature Chavín work. This paper examines the imagery and arguments of key publications by Tello and his student and intellectual disciple, Rebeca Carrión Cachot, on the Recuay culture (ca AD 100–700). Together, they discerned the culture's fundamental diagnostics: pottery, architecture, stone sculpture and ritual practices associated with ancestor-fertility cult. Both employed these elements to epitomise archaeological styles and compartmentalise cultural regions, at the same time that they were positioned as units in broad comparative thinking (e.g., religion, complexity, diffusion, cosmology). The paper contends that their Recuay findings emerged largely out of collections work, ethnohistory and close analysis of objects and 'artworks'. Notably, field archaeology had little to do with their intellectual legacy on Recuay; rather it was won through ambitious visual arguments and analogies, and expressed most saliently by their use of illustrations in a 'visual archaeology.'

Lauer, Matthew [161] see Braje, Todd

Laughlin, Tyler [8] see Keene, Joshua

**Laugier, Elise Jakoby (Dartmouth College)**

[238] *Reconstructing Land-Use Histories in Ecologically Transitional Mesopotamian Landscapes*

This poster presents results of the Sirwan (Upper Diyala) Regional Project's (Kurdish Region, Iraq) 2017 offsite research in the Kurdish Region of Iraq. Off-site investigations of Mesopotamian landscapes provide evidence of land-use practices and inform our understanding of strategies and structures of past agro-economic systems. Thus, the aim of the 2017 season was to employ multiple remote sensing technologies (including magnetic gradiometry and drone-based imaging) to prospect for and associate land-use features with single-period archaeological sites in varying ecological zones. Remotely sensed evidence for synchronic and/or diachronic variation in land-use practices within the study region may provide insight into unique and varying management practices necessary in transitional ecological zones.

Laugier, Elise Jakoby [68] see Casana, Jesse

Laumbach, Karl [290] see Holloway, Richard

**LaValley, S. Joey (Logan Simpson Design, Inc.)**

[186] *Elko Litter: Analyses of an Elko Series Point Manufacturing Site in Central Nevada*

While Great Basin archaeologists use projectile points as time-sensitive markers, these typologies are based on the morphological characteristics of the finished artifacts. In most cases, points were produced elsewhere and curated to their final destination or they are found within a palimpsest containing a mixed bag of flaked stone tools and debitage. Seldom are archaeologists able to analyze debitage specific to the production of points. In 2016, Logan Simpson archaeologists recorded a small lithic scatter containing over 30 broken projectile points, 20 biface fragments, and thousands of flakes within a 30-by-30-meter area in central Nevada northeast of Monitor Valley. The site appears to be a spatially and temporally discrete Middle Archaic Elko series point retooling locus. As such, it provides a unique opportunity to analyze the debitage produced during the Elko manufacturing process and the spatial distribution of artifacts at this type of site. It is also presumed that the points were produced by the same individual or individuals and discarded at the same time. Therefore, an analysis to identify the morphological variability or continuity within the Elko series point type at a given point in time can also be performed.

LaValley, S. Joey [325] see Arnett, Abraham

**Lavin, Lucianne (Institute for American Indian Studies)**

[203] *The Venture Smith Site: An Eighteenth-Century African American Homestead in Haddam, Connecticut*

The Venture Smith homestead is an important eighteenth-century rural black archaeological site with a remarkable level of integrity, associated with a person significant to American history. Born about 1729, Broteer Furro was an African prince abducted and sold into slavery when only six years old. Thirty years a slave, he purchased his and his family's freedom and became a prosperous mariner-merchant-farmer and benefactor to fellow blacks. At his death in 1805, he owned over 100 acres of farmland, three houses, outbuildings, a wharf, and numerous watercraft. Respected by white neighbors/associates to whom he was known as Venture Smith, he became a local folk hero. Historical documents speak of his integrity, courage and strength. Smith's life story is critically important to the study of slavery in New England, to African-American history, and to American cultural heritage. He is the focus of ongoing research across several continents. The BBC produced a film on his life: *A Slave's Story* (2007). For reasons to be discussed, though not formally a State Archaeological Preserve, the Venture Smith site warrants consideration as a National Historic Landmark.

**Law, Karly**

[338] *Student Safety and Experience in Archaeology: Building a Diverse Future*

When people of color pursue college educations, safety is often a priority. Colleges and their respective departments, become their home, faculty become mentors, and their fellow students become their family. An enormous amount of trust is placed in our departments and we are often left feeling alone. As graduate students and Teaching Assistant's, we are required to receive orientation and training that address procedures within federal and institutional guidelines yet we receive no orientation to help us navigate abusive behavior, and consequently are placed in situations by those mandated to teach and mentor us, exposing us to harm and leaving us feeling powerless in both the classroom and the field. In archaeology, women

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and other non-cisgender students are at greater risk than their counterparts.

The Society for American Archaeology's 2017 statement on Sexual Harassment and Violence, formally recognizes that "intimidation...has been legally recognized as having a chilling effect on learning and workplace experiences..." This experience is further undermined by occurrences of discrimination, harassment, and differential treatment in the classroom, lab, and the field. It is imperative that we lobby for training, education, and resources.

### **Law Pezzarossi, Heather (Syracuse University)**

[272] *Being 'Post-Indian' in 19th Century New England*

In the decades following the American Revolution, Native people throughout Southern New England took part in the development of a Native basket industry specifically targeted for settler consumption. Scholars have long acknowledged that basket styles communicated tribal and even familial affiliation among basketmakers and Native community members. But for customers, the objects represented a connection with a Native artisan who filled the role of the "Vanishing Indian," an emerging trope in popular culture and politics in the early decades of the Republic. Vizenor reminds us that his concept of the "post-indian" condition is often a study in the "simulation of absence," in which the absence of "ontologically "real" persons that conform to the stereotype of Indians circulating in the hegemonic US culture, Native American people simulate those images (Vizenor and Lee 2003: 161), the "post-indian" being a subject willing to engage with and push the accepted boundaries of a stereotypical Indian identity (Vizenor and Lee 2003). In this paper, I'll take a closer look at basketmakers' engagement and adept manipulation of developing colonial tropes of Indianess in light of Vizenor's ideas about what it means to be "post-indian".

### **Lawhon, Taylor (University of Alabama) and David Mixter (Binghamton University)**

[147] *To Love and to Leave or to Never Have Loved at All?: Abandonment Deposits within the Late Classic Maya Palace at Actuncan, Belize*

In 2012, excavations were conducted within a Late Classic noble palace at the ancient Maya site of Actuncan, located in western Belize. Remains of a large deposit of Terminal Classic materials were recovered from a corner of the palace's primary courtyard. Based on its location on the courtyard surface and below collapse, the deposit was assumed to date to the period of the palace's abandonment. The placement of this deposit was contemporary with Actuncan's 9th-century renaissance as a post-royal capital after centuries of incorporation into polities ruled by kings located at nearby Classic period centers. Mixter and colleagues have argued that Actuncan's palace served as a noble's residence during the Classic period and was terminated during the Terminal Classic because of its symbolic association with external forces that had previously dominated the site. Drawing on new ceramic analysis, this paper looks in detail at the contents and context of the deposit to reassess the significance of the abandoned palace to Actuncan's thriving Terminal Classic community.

### **Lawler, Andrew**

[194] *Discussant*

### **Lawler, Brooks (University of Alaska Fairbanks)**

[250] *Clarifying Perceptions of Rock: Prehistoric Use of Common Toolstone in Tangle Lakes, Alaska*

Archaeologists have had difficulty agreeing upon uniform designations of certain kinds of toolstone that are not easily distinguishable visually. There are occasions when the archaeological definition of toolstone material and the geological definition of the same toolstone material do not match. A situation where this discrepancy might arise is when archaeologists give a more specific name to a cryptocrystalline silicate that is difficult to identify based on visual analysis. An understanding of the geological definition and geochemistry of toolstone can allow archaeologist to ask more specific questions about toolstone provenance, procurement, and use. The toolstone variability among sites in the Tangle Lakes Region is not well understood, and is thought to belong to two local quarries. This project seeks to understand the geochemical composition of two cryptocrystalline silicate toolstone quarries and visually similar artifacts from specific activity areas from three sites in the region at varying distances from the quarries. The toolstone variability will be defined by geochemical groupings using XRF and pXRF analysis. Future analysis will attempt to geochemically match the artifacts with the two quarries, and learn if there is more variation in the material than can be accounted for by the two quarries.

Lawler, Dennis [212] see Perri, Angela

### **Lawrence, John (California State University Northridge), Cathy Costin (Department of Anthropology, California State University), Kathleen Marsaglia (Department of Geological Sciences, California State University), Michael Love (Department of Anthropology, California State University) and Hector Neff (Department of Anthropology, California State University)**

[95] *Petrography, Production, and Provenance of Ceramics from La Blanca, Guatemala*

The Middle Preclassic (900–600 BCE) was a critical time of political and social centralization in the Guatemalan lowlands. Of particular interest is La Blanca, one of the first polities to rise and show signs of regional influence and potential urbanization. To reconstruct everyday life I am using excavated ceramic refuse to observe dynamics surrounding three households. This, in turn, elucidates elements of La Blanca's political economy associated with the manufacturing and production of ceramics. To observe this I am adapting Dickinson's methods of mapping interaction spheres using petrography to a household level. Reviews of local geologic sources and 90 sherds have been collected. Petrographic examination of sherds has shown three distinct compositional groups: Mineralic, Volcanic, and Vitric. From these groups, representative samples have been selected and point counted using the Gazzi-Dickinson method. To correlate sherd samples to potential sources, three modern sands were sampled and seven Paleo sands from the Missouri University Research Reactor were provided. These samples were analyzed using the same methods as the sherds. Preliminary results indicate a local geologic provenance for raw materials and varied clay sources and manufacturing techniques among households. This suggests that each household was producing their own ceramics and trading amongst themselves.

Lawrence, Mike [256] see Cartagena, Nicaela

Lawrence, Mike [256] see Pierce, Karen

### **Lawton, Patrick (Michigan Archaeological Society)**

[205] *Chiasin (The Big Rock): Mementos of Identity*

The story of Chesaning begins long before the first historic documents; the village's name originating from a massive stone pushed from Ontario by glaciers. This memento, known as the Big Rock, or "Chiasin" in the Anishinabe language was and continues to be an unmistakable feature on the landscape. According to pioneer histories, Chiasin was a place of prehistoric corn feasts and ceremonies. However, when visited in 1837, one such source reports a haunting lack of people. Where had the people of Chesaning gone?

Today the Big Rock lies adjacent to a schoolyard- accessible to the public, though without any accompanying narrative of explanation. Many children go through Chesaning's schools without discovering the Native American history around them. Why are some aspects of Chiasin's history remembered and others forgotten? Is the geological anomaly in the schoolyard the true Big Rock? The author will review archaeological and historical information

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from between the years 1600 and 1860 regarding the Chesaning area to shed light on these mysteries and to educate the public. Educational programming, interpretive signs, and the establishment of a Chesaning Historic Preservation Commission in coordination with the Chesaning Historical Society, Chesaning Township, and the Village of Chesaning are proposed.

**Layco, Wendy (California State University Los Angeles), Jessica Strayer (University of California, Santa Barbara), Samantha Lorenz (Autry Museum) and Toni Gonzalez (University of California, Santa Barbara)**

**[134]** *Cavetuns: Unexplored Theoretical Implications of a Discovery at Mul Ch'en Witz, La Milpa, Belize*

In June of 2017, the Contested Caves Archaeological Project (CCAP), explored what was thought to be a partially capped chultun at the site of La Milpa, Belize. On entering, however, it became clear that the feature was actually a small, natural cave with a classic chultun-style entrance carved into it. Two of the cave's three chambers contained small pools of water, which receded into the porous limestone, within days of their discovery. The pools make any possibility of storage infeasible particularly during the rainy season. Over the subterranean feature, the Maya constructed a rubble cored platform, identical to a platform constructed over another chultun at La Milpa. The cave—water association of this cavetun forces a consideration of the feature in terms of ancient Maya sacred landscape. The discovery of a hybrid cave-chultun further establishes a link between the two types of subterranean space.

**Lazrus, Paula Kay (St. John's University)**

**[54]** *A Long Walk from Town: Early 19th Century Landuse in the Territory of Bova*

In the early 1800s the majority of Bova's citizens live in their hilltop town while holding small plots of land in multiple locations, some quite a distance from the town itself. Archival records from notaries, diaries, and cadastral holdings paint a picture of an independent community of low income citizens plying their trades and rather detached from the larger economic systems around them. Despite the abundance of natural resources available in the landscape, the community was not fully integrated into the larger economic system of the region, other areas of the Italian peninsula, or the larger Mediterranean world. This poster explores the relationship between an individual's multiple landholdings and where within the landscape this land was located.

**[54]** *Chair*

Lazrus, Paula Kay [54] see Ullah, Isaac

Le Moine, Jean-Baptiste [230] see Halperin, Christina

Le Roux, Petrus [29] see Schulting, Rick

Lea, Trevor [106] see Wagner, Dustin

**Leach, Melinda (University of North Dakota)**

**[180]** *Rock Art in the High Rock Country: A Contextual View*

Prehistoric rock art increasingly is understood to be embedded in complex cultural systems of social routines, kin networks, economic landscapes, technological change, seasonal population movements, domestic and task-specific foraging behaviors, and variable gendered activities. The Holocene record of occupation and use of the High Rock Country in the Northern Great Basin provides an opportunity to explore such complex contexts of rock art. Rich lithic sources, strategic locations for hunting, and abundant gathering landscapes in the region are marked by substantial rock features, including petroglyphs and, more rare, pictographs. Focusing on a long history of research at the Massacre Lakes, Serendipity Shelter, and elsewhere in the High Rock Country, I examine rock art features in their ecological settings and their co-occurrence with associated milling equipment and obsidian from a wide range of volcanic sources. With these multivariate sources of information, a picture of shifting landscapes, social networks and gendered activities emerges to inform the context and function of rock art in the Northern Great Basin.

Leach, Peter [238] see Milton, Emily

**Leach, Peter (University of Connecticut; Geophysical Survey Systems, Inc.)**

**[294]** *Minimally-Invasive Geoarchaeological Investigation of a Sub-marsh and Intertidal Precontact Site in New Hampshire*

Many precontact archaeological sites in New England exhibit poor preservation of organic materials but they occupy relatively stable upland landforms. Conversely, intertidal and submerged sites often contain exceptional organic preservation but exist in or near high-energy and erosive environments. This paper describes minimally-invasive geoarchaeological investigations of an Archaic to Terminal Archaic site in New Hampshire that is buried by salt marsh peat, exposed at a rapidly-eroding shoreline, and discontinuously preserved in a dynamic intertidal zone. Two years of intertidal UAV mapping and digital photogrammetry have generated sub-centimeter digital elevation models and allowed very high resolution assessments of shoreline retreat and sediment mobilization. Recordation of exposed stratigraphic profiles is elucidating the multi-component stratigraphy and complex post-occupation submergence and salt marsh development. Coring the marsh and GPR experiments focus on paleogeographic reconstruction of pre-submergence upland landscapes. Other research areas include radiocarbon dating of occupation horizons and timing of submergence, macrobotanical analyses to identify depositional environments, and foraminifera sampling to constrain paleo-tidal levels. The main goal is to understand the timing and nature of submergence as part of a larger effort to model the preservation potential and location of other sub-marsh, intertidal, and submerged sites in the region.

**Leader, George (University of Pennsylvania), Kimberlee Moran (Rutgers University-Camden), Jared Beatrice (The College of New Jersey) and Anna Dhody (Mutter Research Institute)**

**[204]** *Preliminary Results of Material Culture from the Historic First Baptist Church Cemetery, Philadelphia (ca. 1700–1860) and Analytical Problems Arising from Stressed Excavations and the Lack of Formal Legal Oversight*

The material culture found in association with the skeletal remains recovered from the historic First Baptist Church of Philadelphia cemetery, which was in use from 1700–1860, provides a valuable glimpse into colonial and post-colonial burial practices in one of early America's most important cities. The interior material culture in the form of burial goods is most often minimalistic with few exceptions while the exterior material culture (i.e. coffin hardware) assists in relative dates while highlighting stylistic trends of the day. As one of the largest known collections of 18th and 19th century coffins yet unearthed in historic Philadelphia, the assemblage offers invaluable data on mortuary behavior of some of America's first citizens and immigrants. However, the difficulty in excavation, due to the lack of site access, time, and legal concerns created problems that are still felt in post-excavation analysis.

Leader, George [304] see Abdolazadeh, Aylar

Leader, George [204] see Moran, Kimberlee



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**LeBlanc, Megan****[224]** *The Hydrologic and Geologic Dynamics of the Las Peñas Spring*

This presentation addresses the hydrology of agricultural terraces and a spring associated with the Late Intermediate Period (post AD 1200) site of Las Peñas located in the Moquegua Valley of Peru. Positioned 150 meters northwest of Las Peñas, the spring is located at roughly 2,700 meters in elevation and sits at the base of several agricultural terraces. This field system was presumably in production at the time Las Peñas was occupied and is still in use today. Using coring techniques, sediment samples, GPR data, and aerial photography, I examined the hydrologic and geologic dynamics of the landscape to understand their potential relationship to the people who occupied Las Peñas. These data were analyzed in combination with sediment samples from the site of Cerro X, an unexcavated potential Middle Horizon reservoir, to put the Las Peñas spring in the broader context of the Moquegua Valley. Small spring systems can teach archaeologists about water storage in arid, highland conditions. It can also provide unique insight on the ancient and modern hydrology of sloped agricultural terraces. Springs at the base of agricultural terraces provide fresh water resources for humans and their animals in an area where water is sparse.

**LeBlanc, Steven (Harvard University)****[139]** *Discussant*

Lebrasseur, Ophelie [212] see Larson, Greger

Leckman, Phillip [268] see Heilen, Michael

Leclerc, Elizabeth [13] see Gilmore, Kevin P.

**LeCount, Lisa (University of Alabama)****[129]** *Examining the Institutionalization and Transformation of Maya Kingship at Actuncan, Belize using Collective Action Theory*

Here, I summarize the major research questions and results from the Actuncan Archaeological Project, which has been on-going since 2001. The project was initially designed to examine the ways Preclassic Maya leaders institutionalized political authority from the perspective of household archaeology, but has expanded to include excavation of civic architecture and remote sensing in open spaces. My research is informed by collective action theory, and the degree to which leaders engaged in exclusionary and inclusive practices over the site's 2000 years of occupation. Findings have not supported my original exclusive power hypothesis in which early rulers circumvented kin-based authority by out-competing and fragmenting established households. Instead, the small number of founding elite and commoner houses enjoyed socio-economic prosperity during the Terminal Preclassic period when kingship was institutionalized. The rise to regional authority was rapid at Actuncan, which was built by burying an earlier settlement and greatly expanding civic structures. This expansion was achieved through inclusive practices that mobilized hinterland populations' labor and loyalties. Later, Classic-period elites experienced boom-and-bust cycles of growth and abandonment, which I argue is the result of elite competition for exclusive power. Evidence supporting these ideas is presented by contributors to this symposium.

**[129]** *Chair*

LeCount, Lisa [129] see Blitz, John

Ledbetter, Jerald [81] see Jones, Katherine

**Ledford, Kelly (Florida State University)****[102]** *Let Them Eat Corn: Using Stable Isotopes to Explore Turkey Management in the Mississippian Period Southeast*

The eastern wild turkey (*Meleagris gallopavo sylvestris*) is a well-documented resource for Native Americans in the Southeastern United States. Recent research suggests that turkeys may have been managed by Mississippian period people in Middle Tennessee as opposed to being hunted solely in the wild. These conclusions are based on a combination of ethnographic sources, osteometric data, and other non-osseous evidence. As a part of my thesis, I extracted collagen from 12 prehistoric turkey specimens in Middle Tennessee to determine if their isotopic signatures reflect that of a wild diet comprised of grasses and shrubs, or if their signatures indicate their diet was supplemented with agricultural products like maize. I compare the isotope results from this analysis to other research from the Southwestern United States and Mesoamerica where evidence for the domestication of turkeys alongside maize agriculture by prehistoric people is well documented. This research is the first to apply stable isotope analysis to ancient turkey remains in the region. Our understanding of human-turkey relationships in the region is lacking and this study aims to provide a more holistic interpretation of the complex human-environmental relationships of the Mississippian period in the Southeast.

Ledogar, Sarah [304] see Jenz, Trisha

**Lee, Craig (Metcalf Archaeological Consultants & INSTAAR), Pei-Lin Yu (Boise State University), Edward Jolie (Mercyhurst University), Kathy Puseman (Paleosciapes Archaeobotanical Services Team) and Halcyon LaPoint (Custer-Gallatin National Forest)****[48]** *Beyond the Points: Sociocultural Complexity Revealed by Non-hunting Artifacts from Melting Ice Patches in the High Alpine, Greater Yellowstone Area, USA*

The recovery of chipped stone projectile points, bows, dart and arrow foreshafts and shafts, and the remains of prey species—notably bighorn sheep (*Ovis canadensis*)—in direct association with melting Greater Yellowstone Area (GYA) ice patches illustrates that hunting was a primary activity for Native Americans at these features. The recovery of other, non-hunting related, types of organic artifacts at ice patches suggests a broader utilization of the alpine environment. Although fewer in number, these artifacts bolster the contention that the alpine archaeological record reflects repeated occupations by family units—or still larger groups—taking advantage of a seasonally enriched biome. Artifacts that will be discussed include cordage made from hair (undated), a ca. 1375 cal BP twisted object made of wapiti (*Cervus elephus*) hide, several wood objects of uncertain function ranging in age between ca. 6200 cal BP and 1370 cal BP, and a ca. 1340 cal BP basket/tray made of willow (*Salix* sp.). In concert with a growing appreciation for the robust, increasingly well-documented chipped stone record from non-ice patch areas within the GYA alpine, the non-hunting artifacts recovered at ice patches provide an important avenue for understanding how Native peoples integrated with these ecosystems.

Lee, Craig [155] see Neeley, Michael

**Lee, Samantha (The University of Maryland)****[308]** *Trading In Children*

A decade of archaeology at Wye House Plantation in Maryland has yielded a multitude of information regarding the institution of slavery and the experiences of enslaved individuals. Whether or not enslaved peoples were deliberately bred systematically to produce children for sale by the master is a topic that has been generally neglected in modern scholarship. This practice demonstrates the inherent inhumanity of slavery and is an example of what the scholar Orlando Patterson describes as “the gendered nature of slavery.” Women and children were often the most exploited as a result of

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their sexuality, a practice that has continued today in the modern era. The Works Progress Administration's Slave Narratives present multiple firsthand accounts of the prevalence of this abhorrent practice in the United States. There is reason to believe that there may have been a breeding plantation among the properties of the Lloyd family, the owners of Wye House Plantation. This paper will focus on the gendered nature of slavery, the custom of slave breeding, and the possibility of a breeding plantation among the properties of the Lloyd family.

Lee-Thorp, Julia [249] see Santana Sagredo, Francisca

**LeFebvre, Michelle (University of Florida)**  
[149] *Discussant*

LeFebvre, Michelle [51] see deFrance, Susan

Lefèvre, Christine [43] see Manin, Aurelie

**Lehner, Joseph (University of Central Florida)**

[171] *The Metallurgical Cycle and Human Responses to Material Fatigue*

Innovations in metallurgy had and continue to have significant and transformative effects on society. From mineral exploration and mining to primary metal production, manufacturing, and consumption across a range of social contexts, metallurgy influenced a wide range of distinctly human conditions. However, while metals are particularly transmutable, they also rapidly corrode back into increasingly stable mineral compounds in processes that people tried to mitigate and often unsuccessfully overcame. This paper discusses how metal production and consumption leads to this poorly studied phenomenon of material fatigue, where metals embrittle, corrode and ultimately fail, giving way to potentially systematic societal and environmental upheaval with oftentimes unpredictable and disastrous effects. Using ancient and modern case studies, this paper will then examine the human response to overcome the problems of material fatigue. In particular, we examine the case of the 1200 BC Cape Gelidonya Shipwreck found off the coast of southwestern Turkey, and whose cargo of copper ingot and alloy scrap metal demonstrates how some sectors of society worked alongside consumers to recycle fatigued metal. Examination of this metallurgical cycle—from minerals to metals and back again—affords a new perspective on the role of metal technology in human societies.

Lehner, Joseph [177] see Dumitru, Ioana

Lei, Xingshan [177] see Chastain, Matthew

**Leight, Megan (CUNY Graduate Center), Brent Woodfill (Georgia State University) and Alexander Rivas (Washington University in St. Louis)**

[176] *The Production and Exchange of Perishable Goods at Salinas de los Nueve Cerros and Atop the Coban Plateau*

Investigations at Cancuen, Sebol, Salinas de los Nueve Cerros, and other sites at the base of the Guatemalan highlands since the late 1990s have shown the importance of the region for importing and refining a variety of highland goods for the lowland market. While most of the emphasis has been placed on the goods for which there is direct evidence of production and exchange—obsidian, jade, iron pyrite, and other lithic commodities present in abundance at these and other sites—Demarest, Dillon, and other scholars have posited that these sites were also important nodes of exchange for perishable goods that are harder to find in the archaeological record.

This presentation will focus on two of these perishable commodities—salt and quetzal feathers, both of which have ample ethnohistoric descriptions of their production during and after the Spanish conquest, and both of which are common in Classic Maya lowland iconography. The authors will discuss production techniques, their importance in the lowland economy, and Precolumbian evidence for their production and exchange.

**Leines, Madeline**

[43] *Perceptions vs. Reality: Animal Lives in the Ancient Maya, Aztec, and Inca Cultures*

Past and present human-animal relationships have always been shaped by culturally-based beliefs, perceptions, and treatment of nonhuman animals, which in turn influence the lives of the animals in their environments. That being said, how accurate were ancient cultures in their attempts to understand animals, and how did subsequent human perceptions influence animal realities? What might it have been like as a nonhuman animal living near ancient peoples, based on biology and culture? What of the animals in Central and South America, for instance? This research provides an interdisciplinary, anthrozoological study of animal lives in the ancient Maya, Aztec, and Inca cultures. After a brief introduction to the cultures and species present among them, this paper delves deeper into an analysis of four animals (felines, deer, snakes, and canines) and their potential, culturally influenced realities. A comparison of these interspecies relationships reveals a cultural continuum based on ideological and practical proximity to nature, creating a framework for future studies of ancient, as well as present, human-animal interactions.

Leitermann, Garrett [91] see Crawley, Andrea

**Lemke, Ashley (University of Texas at Arlington)**

[244] *Anthropology Underwater: Landscape Archaeology above and below Water in the Great Lakes*

Submerged prehistoric landscapes have unique traits which make them invaluable to archaeologists—increased preservation of organic remains, Pompeii-like snap shots in time, and data that either do not exist on land or are deeply buried. These attributes make the few challenges that remain for conducting archaeology underwater more than worth the effort. Early human occupation in the Great Lakes has been difficult to investigate as acidic soils and dynamic water levels left many archaeological remains either poorly preserved or submerged. Ongoing underwater research in Lake Huron is beginning to fill gaps in our knowledge of early hunter-gatherers in this region, and provides unique data of caribou hunting 9,000 years ago using stone built hunting structures. Microregional investigations across this preserved submerged landscape have generated testable hypotheses for the location and nature of contemporary sites on land. Preliminary terrestrial research supports these hypotheses. Rather than separating archaeological research at the water line—connecting terrestrial and underwater records is a holistic approach for reconstructing prehistoric environments and forager adaptations. Anthropological archaeology underwater provides a theoretical framework for such a landscape approach to prehistoric occupations in the Great Lakes and elsewhere.

**Lemoine, Ximena (Washington University in St. Louis)**

[336] *Neolithic Pigs and People along China's Fertile Arc: Regional Expression and Domestication*

The foothills of mountain chains along river catchments, or "Hilly Flanks", have repeatedly been shown to be key to understanding the origins of agriculture throughout Eurasia. During the Neolithic, sites in the northern part of China's Fertile Arc (see Ren et al. 2016)—showing the earliest evidence of the cultivation of Chinese Millets—are situated along China's own "Hilly Flanks". In contrast, southern sites along the Arc cultivating rice, are located in a diverse array of landforms including piedmont plains and intermountain basins. Whereas the relationship between people, landscape,

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and the crops has seen significant academic study, the human-animal component has yet to be explored in detail. The pig is China's earliest endemic domesticate, and may have been domesticated multiple times in this region. Through demographic reconstruction and stable isotopic analysis of pig populations from early Neolithic sites from the northern and southern parts of the Arc, belonging to the Xinglongwa 兴隆洼 culture in Inner Mongolia—representing the northern part of the Arc—and Jiahu 贾湖 from the Huai River Valley in Henan—representing the southern region, this paper intends to understand how landscape and local contexts shaped human-pig relationships and trajectories of domestication and management during this critical period in Chinese prehistory.

**Lemonnier, Eva and Charlotte Arnaud (CNRS-Paris 1 panthéon Sorbonne)**

**[142]** *Defining Rurality at La Joyanca and Naachtun (Guatemala): Land Use, Architecture and Social Dynamics*

Based on the study of two Classic Maya Lowland sites, La Joyanca and Naachtun (Guatemala), this paper explores the topic of rurality through the parameters of potential land use, visible architectural variation, and plausible population mobility. La Joyanca was a medium-sized settlement surrounded by villages and hamlets all of which were recorded by means of conventional surface mapping, whereas Naachtun was a regional capital located amidst extended communities linked by causeways that have been identified through recent LIDAR survey. Paleoenvironmental information on land use is available in both cases. We aim at assessing ancient 'heartland' and 'hinterland communities', and their relationships, as an attempt at furthering the implied concepts. Relevancy of rural and urban categories is discussed.

Lemonnier, Eva [80] see Nondédéo, Philippe

**Lentz, David L. (University of Cincinnati), Nicholas Dunning (University of Cincinnati) and Vernon Scarborough (University of Cincinnati)**

**[76]** *Agriculture, Land Management and Expressions of Elite Control at the Ancient Maya City of Tikal*

While it seems evident that the elites and royal personages at Tikal influenced at least some aspects of day-to-day activities of the Maya inhabitants, it has not been clear how this influence became manifest, particularly in regard to agriculture and other aspects of land management decisions. Recent paleoethnobotanical and archaeological studies at Tikal, however, bring some insight to this cultural black box. Three examples from the paleoethnobotanical record provide empirical evidence that indicate how the Maya elite managed their forests, set aside certain tracts of land for special agricultural projects and constructed an irrigation system to reduce the vagaries of rainfall-dependent agriculture. The first example relates to the enormous beams of sapodilla (*Manilkara zapota*) wood that were used to construct Temples 1–4 and only could have come from old growth forests, likely in a protected context, as in a pak'-al. The second example is the Inscriptions reservoir, which was not a reservoir at all, but more likely a rejollada where specialty crops, such as cacao (*Theobroma cacao*) could have been cultivated. The third example is the Perdido reservoir that received drainage water from the Lost World plaza for subsequent use in irrigated maize (*Zea mays*) agriculture.

Lentz, David L. [153] see Wendel, Martha

**Leon Estrada, Xochitl (Universidad Veracruzana)**

**[93]** *Paisajes, recursos y su aprovechamiento en Los Tuxtlas, Veracruz, Mexico*

Síntesis de una investigación arqueológica que se enfocó en analizar y comparar la morfología del paisaje cultural de antiguos asentamientos prehispánicos en la sierra de Los Tuxtlas, Veracruz, México. Combinando aspectos de la geografía cultural, procesualismo, y unidades de paisaje geomorfológico se pudieron describir y analizar sitios arqueológicos en Los Tuxtlas, así como discernir las posibles dinámicas de agencia y adaptación del medio ambiente, uso del espacio y aprovechamiento de los recursos naturales, para inferir relaciones inter e intrarregionales que influyeron el desarrollo social, cultural y económico del área de estudio.

**Leonard, Daniel (HDR), Kendra Rodgers McGraw (HDR) and Beniamino Volta (HDR)**

**[268]** *DoD Legacy Data: Leveraging GIS and the Web for Success*

While facility-wide cultural resource management at large DoD installations has increasingly been managed with GIS, many organizations have legacy information in the form of hard copy reports and non-searchable site files. In order to successfully fulfill legal and ethical responsibilities as long-term stewards of cultural resources on these installations, it is imperative that DoD staff make the incorporation of these legacy records into their enterprise GIS management framework a priority.

For Edwards Air Force Base, HDR designed and deployed a web-based SQL server application to facilitate the document analysis and data entry from multiple archeologists into the established DoD cultural resources GIS schema. The application was developed to handle basic conflict resolution among data entries and facilitated streamlined QC reviews. The SQL application and web interface were designed to utilize a primary spatial table and secondary non-spatial tables. This allowed for additional contextual information to be added for historic properties, allowing for improved review process and research design capacity. In total HDR performed digital curation of over 4,800 site records on EAFB into an ESRI geodatabase file that is fully compatible with the installation's enterprise GIS, and contributed significantly to the long-term management of cultural resources on the installation.

Leonard, Daniel [162] see Glover, Jeffrey B.

**Leone, Mark (University of Maryland)**

**[208]** *Spirit Possession in the Chesapeake*

Proletarian drug foods north of the Caribbean in the Chesapeake area include spirits. Spirits include bourbon. Spirits include those of the dead, as well as the Holy Ghost. This paper attempts to introduce the concept of altered states of consciousness produced by both kinds of spirits. Can these be called proletariat drug foods?

The purpose of this paper is to ask whether spirits of either kind so dull the senses that an acute perception of reality escapes the exploited or merely produces the kind of patience that it takes to wait for the moment of revolution. Another way of asking this question comes from Linebaugh and Rediker's *The Many-Headed Hydra: Does capitalism inevitably destroy itself?*

**[308]** *Discussant*

**[308]** *Chair*

Leplongeon, Alice [198] see Brandt, Steven

**Leppard, Thomas (University of Cambridge)**

**[161]** *The Anthropocene: Present Singular or Past Plural?*

To what extent are Anthropocene dynamics prefigured or anticipated in microcosm during the later Quaternary, and how do scalar differences in environmental organization (result in anthropic processes working at different rates) complicate any search for a Golden Spike? Drawing on datasets from islands worldwide during the terminal Pleistocene and Holocene, this paper explores how humans drive change in biophysical systems,

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emphasizing similarities of type yet differences of scale between deep-time and more recent instances of human-driven environmental change. In so doing, an attempt is made (a) to underline long-term and general trends in human-environment interaction and (b) to suggest that the emerging biodiversity crisis represents a culmination of these trends rather than being fully qualitatively novel.

[125] *Discussant*

**Lercari, Nicola (University of California Merced), Denise Jaffke (California State Parks), Jad Aboulhosn (University of California Merced), Graham Baird (University of California Merced) and Anaïs Guillem (University of California Merced)**

[130] *Citizen Science Archaeology at Bodie State Historic Park*

Bodie State Historic Park is located in the western Great Basin, near the California and Nevada border and encompasses a 2,900-acre historical landscape comprised of buildings, archaeological sites, and features related to 80 years of Gold Rush era mining. Cultural and natural resources at Bodie are at risk of being lost due to wildfires, earthquakes, and lack of funding. Discussing the application of digital heritage methods in the Bodie 3D Project, this paper focuses on community-engaged preservation initiatives that will test the efficacy of archaeological citizen science. The project aims to engage local communities and the visiting public in recording archaeological resources through training and crowd-sourced field activities. UC Merced scholars and California State Parks cultural resources specialists collaborate on research data dissemination and outreach through mobile apps, Augmented Reality techniques, and digital documentation technologies. We hope that active involvement will lead to the public's appreciation of the park's valuable resources and foster a true sense of stewardship and preservation.

[172] *Chair*

Lercari, Nicola [172] see Lingle, Ashley

**Lerner, Shereen (Mesa College)**

[233] *Discussant*

**Leroy, Stéphanie (LAPA-IRAMAT, NIMBE, CEA, CNRS, Université Paris-Saclay), Mitch Hendrickson (University of Illinois at Chicago, Department of A), Emmanuelle Delque-Kolic (LSCE-LMC14, CEA, CNRS, IRD), Enrique Vega (LAPA-IRAMAT, NIMBE, CEA, CNRS, Université Paris-Sa) and Philippe Dillmann (LAPA-IRAMAT, NIMBE, CEA, CNRS, Université Paris-Sa)**

[175] *IRANGKOR Project: Production, Trade and Consumption of Iron in the Khmer Empire, Cambodia (9th to 15th c. CE)*

Investigation into material production and distribution is an important way of understanding the political and socioeconomic organization of premodern states. Iron, with its specific technological characteristics and diverse cultural utility, can be perceived as one of the most dynamic materials for facilitating social and cultural transformation. Reconstructing how iron was managed in the Khmer Empire is therefore a critical perspective for documenting the interrelationship between its multiple sociotechnical systems and greater historic trajectory. This paper discusses the combined results of technological, chronological and sourcing analyses of iron to generate a holistic view of Angkor's iron economy. This investigation was paired with extensive analyses of the vast iron production landscape of central Cambodia (INDAP project) and evidence from northeast Thailand. The focus will be on the issue of provenance to determine the origin of the production sites and how iron was incorporated into the broader exchange system. Combining multiple types of analyses enables us to identify changes in the production and consumption strategies of the Khmer state and how they translated into broader impacts felt across the empire.

Leroy, Stéphanie [137] see Dillmann, Philippe

Lertcharnit, Thanik [282] see Palefsky, Gina

**Leslie, David (University of Connecticut) and Sarah P. Sportman (Archaeological and Historical Services, Inc.)**

[294] *Lithic Analyses of Site 21–85, an Archaic–Woodland Period Site near Robbins Swamp and the Housatonic River, Connecticut*

Site 21–85 is a large, multi-component site, with Archaic and Woodland period remnants, located adjacent to the Hollenbeck River, a major tributary of the Housatonic River, and Robbins Swamp, the largest freshwater swamp in Connecticut. The location of Site 21–85 would have afforded past peoples access to the fauna and flora associated with Robbins Swamp, travel routes north and south through the Housatonic River Valley, and fresh water from the adjacent Hollenbeck River. The site is also located less than a mile upstream from the Great Falls, an important landmark along the Housatonic River. A portion of the site was threatened by a construction access road as part of a railroad project initiated by the Connecticut Department of Transportation; the impacts to the site were mitigated by a data recovery project, as required under state and federal laws. Excavations at the site revealed 17 cultural features, Middle Woodland pottery sherds, Middle and Late Archaic period diagnostic projectile points, as well as over 4,500 lithic artifacts. Here, we present the results of the lithic analysis of this data set, and frame the repeated occupation of this site within its broader ecological and cultural context.

**Leslie, Katie (VCP St. Louis) and Melissa Frederick (VCP St. Louis)**

[326] *Veteran Archivists: The Harry S. Truman Reservoir Project*

The Saint Louis laboratory of the Veterans Curation Program processes several archival investigations throughout each five month term, but few have been to the scale of the Harry S. Truman Reservoir Project. This project produced 23 boxes worth of documentation spanning over 268 linear inches. The Harry S. Truman Reservoir is the largest man-made lake in Missouri and covers over 100,000 acres of government owned and flood easement lands. To prepare for the construction of the dam, a number of contractors documented over 2,300 archaeological sites in nine counties; field work that spanned over five years. This paper will discuss an overview of important sites encountered in this archaeological survey, as well as the successes and unintended consequences of utilizing veterans new to the curation of archaeological collections.

**Lesure, Richard (UCLA)**

[59] *Exchange and Interaction in Proto-Mesoamerica: A Comparison of Late Archaic and Early Formative Interregional Networks*

Across much of Mesoamerica, the transition from Archaic to Formative occurred essentially simultaneously at 1800±100 BC. The earliest sedentary, ceramic-using villages occurred in clusters, but the clusters themselves were widely dispersed. They appeared in a variety of environmental settings, and they were surrounded by lands that were either empty or still inhabited by low-visibility/low-density populations. Given such patterns, it is far from obvious what factors would explain the simultaneity of the transition from Archaic to Formative. The goal of this paper is to assess the promise of one idea: that the transition to sedentism and pottery use was at least in part the product of intensified long-distance interaction and exchange in the later Archaic. The research involves assembling evidence on the presence, frequency, and source of artifacts of non-local origin at Archaic and Early Formative sites (obsidian is a significant but not exclusive focus of attention). Assemblages will be assigned as appropriate to four periods: Early-Middle Archaic (prior to 3500 BC), Late Archaic (3500–1900 BC), Initial Early Formative (1900–1400 BC), and Late Early Formative (1400–1000 BC). Is there evidence for heightened interactions during the later Archaic? How do Late Archaic interregional networks compare to those of the Initial Early Formative?

[262] *Discussant*

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**Letouzé, Aliénor (CeRAP (Université Paris-Sorbonne/EHESS))**

**[30]** *The “Sistema 7 Venado”, a Little-known Ceremonial Center at Monte Albán, Oaxaca: A Study of Its Architectural and Ritual Implications*  
 For the past eight years, the French team from the CeRAP (Paris-Sorbonne University and the School for Advanced Studies in the Social Sciences in Paris) has carried out research at the Mesoamerican site of 7 Venado, which extends over 4 ha lying 400 m south of the South Platform of Monte Albán. Directed by Christian Duverger and Aliénor Letouzé, with the support of the INAH, the project has been able to date the site, whose chronology spans 800 BC to AD 300, and has also studied its spatial organization. It is composed of 14 buildings (pyramids, tall long platforms, etc.), arranged around 3 patios and 6 plazas articulated with monumental stairways. The work carried out since 2009 has enabled us to study new contexts at Monte Albán, first by excavating earlier buildings hidden under plazas, and second, by uncovering a large number of offerings of several types (caches, burials...). We propose to analyze the symbolic settlement of the Sistema 7 Venado through the spatial distribution of its architecture in conjunction with the evidence of ritual practices that marked the various cultural stages of this major archaeological site in Mesoamerica.

**Levi, Laura (The University of Texas at San Antonio), Christian Sheumaker (The University of Texas at San Antonio) and Sarah Nicole Boudreaux (The University of Texas at San Antonio)**

**[28]** *Pathways and the Power of Organizational Process: Defining Polity at Wari Camp, Belize*

The ancient Maya community of Wari Camp was organized into a quincunx pattern of four quarters delineated by the intersection of two inter-cardinal alignments. One was formed by a series of “temple-on-the-east” groups running northwest to southeast. The other consisted of a massive, northeast-to-southwest trending drainage modified for foot traffic. At their intersection stood an uncarved stela. Other stelae marked crossroads, while pairs of temple groups stood at entrances into the drainage road proper.

Michael Coe was the first to link the four-quarter scheme with Maya ritual practices celebrating the spatio-temporal limits of community. Other researchers demonstrated how such practices were essential rituals of royalty, some even noting the prominence of processional circuits among temple pairs. Still others pointed to the quincunx—the sign for road in Maya glyphs—as a fundamental trope in Maya thought and expression.

At Wari Camp, therefore, we have a confluence of material images that speak to some of the ways in which the most basic of Maya political units was constituted in symbol and action. This paper will attempt a deeper exploration of the powers inhering in such places, and will argue for the need to better identify them archaeologically.

Levi, Laura [37] see Boudreaux, Sarah Nicole

**Levin, Anais (Grinnell College), John Walden (University of Pittsburgh) and Jaime Awe (Northern Arizona University)**

**[28]** *Lithic Tool Use and Production in an Ancient Maya Neighborhood*

The use and production of lithic tools offers an avenue into the behavior and activities conducted in ancient residential and ritual contexts. We explore variability in the lithic assemblages of various contexts in the ancient Maya neighborhood of Tutu Uitz Na in the Late-Terminal Classic period (AD 700–900). Tutu Uitz Na is one of several neighborhoods surrounding the Lower Dover political center in the Belize River Valley. Variation in household lithic assemblages might vary based on the wealth and status of the occupants or specialized activities involving stone tools. This presentation comprises a synchronic comparative analysis of stone tools and debitage from an intermediate elite ceremonial and residential group, 4 commoner households of high and low status, a specialized lithic workshop and a ritual rockshelter associated with the intermediate elite group. The presentation will offer perspectives on the ways in which the study of lithics can illuminate the internal economic, agricultural, religious and political dynamics of a Classic Maya neighborhood, and the types of activities which people of varying statuses pursued.

Levin, Anais [82] see Walden, John

**Levine, Marc (University of Oklahoma)**

**[248]** *Monte Alban’s Main Plaza: New Perspectives Gained through Geophysical Prospection and Digital Mapping*

Ongoing scholarly debate concerning the function, meaning, and history of Monte Albán’s Main Plaza have important ramifications for our understanding of sociopolitical, economic, and religious life at the Zapotec capital. Although previous investigations have targeted many of the buildings that surround the plaza, none have focused explicitly on the plaza itself. This paper presents the preliminary results of the Proyecto Geofísico de Monte Albán (PGMA), a non-invasive study of the entire Main Plaza utilizing multiple geophysical prospection techniques, as well as microtopographic mapping via drone-aided photogrammetry and a robotic total station.

**[60]** *Discussant*

**[248]** *Chair*

Levine, Marc [143] see Monroe, Cara

**Levine, Mary Ann (Franklin and Marshall College)**

**[66]** *The Burial Ground at Otstonwakin: Native American Mortuary Practices in 18th Century Pennsylvania*

The multinational village of Otstonwakin was a key nexus of colonial and indigenous interaction where colonial identities were expressed as well as constituted through material remains. The sacred landscape that was used by the residents of Otstonwakin to bury their dead was disturbed by road construction projects in both the late 1800s and early 1900s. While the full extent of the cemetery associated with Otstonwakin is unknown, the burial ground is represented by four documented graves and a wide array of funerary offerings, including a rare brass embellished fabric garment. Through an analysis of eyewitness accounts, photographs, and curated material evidence, I discuss the significance of the striking mixture of Native-made artifacts and imported European commodities uncovered at the burial ground. The mortuary practices attest to both change and continuity and reveal the creation of new constellations of material objects in ritual contexts.

**[66]** *Chair*

Levinson, Judith [141] see Kriss, Dawn

Levstik, Linda S. [94] see Henderson, A. Gwynn

**Lev-Tov, Justin**

**[297]** *Animal Bones from Hazor, Israel and a Cautionary Tale of Interpreting Past Ritual*

Within recent years, feasting and other forms of ritual consumption have become more frequently identified in the archaeozoological record of the ancient Near East. Reasons for more frequent identification of ritual sacrifices and feasts vary, but two driving forces certainly are archaeological context, bones found in or near special architecture, and the cultural milieu formed by the region’s ancient textual record. In contrast, I have a skeptical

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tale to tell of ritual production and consumption. This tale takes place at the site of Hazor, a Bronze and Iron Age city mound in Israel. The site has all the correct elements to demonstrate ancient food-related rituals: It was a city of great size and importance; a place where excavations have revealed temples and/or impressive palaces, cuneiform texts and statues of gods; and which produced large bone assemblages. Yet archaeozoological analyses demonstrate a disjuncture between bone patterning on one hand and expectations set by texts and contexts on the other. The question is how to understand the bone debris left by Hazor's elite: Does it represent the diet of uncharacteristically proletarian rulers and priests, or does the patterning present a cautionary tale about too much reliance on text and context?

Lev-Tov, Justin [90] see Greenfield, Haskel

**Levy, Thomas E. (University of California, San Diego) and Margie Burton (University of California, San Diego, Center for Cy)**

**[172]** *At-Risk World Heritage and the Digital Humanities—An Overview of the UC Office of the President's Research Catalyst Project*  
Recent current events have dramatically highlighted the vulnerability of the world's material cultural heritage. Funded by a University of California (UC) Office of the President's Research Catalyst grant beginning in 2016, the At-Risk Cultural Heritage and the Digital Humanities project catalyzes a collaborative research effort by four UC campuses (San Diego, Berkeley, Los Angeles and Merced) to use cyber-archaeology and computer graphics to document and safeguard virtually some of the most at-risk heritage objects and places. Faculty and students involved in this project are conducting path-breaking archaeological research covering more than 10,000 years of culture and architecture in Cyprus, Greece, Egypt, Ethiopia, Israel, Jordan, Morocco, and Turkey. Our aim is to link UC labs, libraries and museums to form a highly-networked collaborative platform for curation, analysis, and visualization of 3D archaeological heritage data. This paper presents a summary of the objectives of the project and digital field data acquisition and technical achievements since the inception of the project.

Levy, Thomas E. [68] see Liss, Brady

**Lévy, Jessica (Pontificia Universidad Católica del Perú (PUCP))**

**[141]** *A Pyro-Engraved Gourd from Cahuachi: Iconographic and Technical Analysis of a Nasca Masterpiece*  
Pyro-engraved gourds discovered by the "Nasca Project" (CEAP) in Cahuachi, Nasca ceremonial center located in the basin of Río Grande, can provide new data about their manufacture and decoration. From a comparative perspective, we study artifact characteristics and archaeological records to understand an unusually large and complex pyro-engraved found during 1994 excavations as an offering associated with ceramics from the last phase of the Early Horizon (Ocucaje 8–9) and the beginning of the Early Intermediate Period (Nasca 1–3). Now on display at the Museo Didáctico Antonini in Nasca, the gourd has Paracas Necrópolis (Topará) and early Nasca elements in its decoration suggesting the existence of an efficient system of social cohesion based on shared rituals. Objects of power with similar iconography marking shared memory include textiles, ceramics, pyro-engraved gourds, and other artifacts related to funerary cult, ritual feasting and music, which express shared elements of social and political identity. The characteristics of the gourd, the production practices that convert it into an object of power, the stylistic conventions of the ritual imagery and its mythological references illuminate relationships between Andean populations and their environment.

Lewarch, Dennis [242] see Franklin, Paris

Lewis, Barnaby V. [72] see Darling, J Andrew

**Lewis, Carenza (University of Lincoln)**

**[87]** *Child's Play? Exploring Archaeological Evidence for Care-Giving in the 19th and 20th Centuries*

This paper will consider how archaeological evidence from two case-studies can inform our understanding of how attitudes to child care affected children's lived experience. I will explore the character and range of archaeological evidence relating to childhood from two very different sites, a 19th-century mission complex in San Diego and a mid-20th century council estate in Lincolnshire, comparing ratios of different types of finds (e.g. marbles, metal toys, doll parts and slate pencils) to consider how archaeology can illuminate differences in the way children were cared for compared with the 'norms' of English nuclear families in the 19th and 20th centuries.

**Lewis, D'andra (Pennsylvania State University Student)**

**[98]** *Scottish Whisky: A Community's Development and Global Impact*

For millennial alcohol has played a prevalent role in the development of communities and human interaction. Scotland is well known for the creation of whisky that made its way to America during the Colonial Period. The goal of this research is to identify the influence alcohol has had on the development of Scotland. Scotland whisky distribution has caused a change in laws, economics, health perspective, and tradition. According to Bill Walker, "Scotch whisky is more than a whisky. It is part of Scotland's heritage and folklore. It is used as a medicine to cure many ills. As a toddy, it can dispel colds and 'flu. In porridge, it can drive out the freezing cold of Scotland's winters. It lubricates the larynx and helps parties go with a swing" (Bower, 2016). As people began migrating from Scotland to America, they brought with them their knowledge of whisky production. Although the entire population of Scotland does not consume alcohol, this product can still be used as an indicator to understand their cultural background. It can also lend explanations to better understand drinking cultures in the United States.

**Lewis, Keely (SC State Historic Preservation Office)**

**[228]** *Chair*

**Lexow, Gwen**

**[338]** *Equity in the Academy and in Archeology*

Recent national media attention on issues of discrimination and harassment in the academy have generated robust discussion and inquiry into how to develop and sustain an environment that celebrates equity and equality and creates a culture where all can thrive professionally and personally. This presentation will sketch the broad contours of these conversations placing them in a national context and providing a framework to understand both institutional responsibilities and ethical imperatives. By outlining the nature and scope of Title IX and other civil rights mandates as they apply across the academy, this presentation provides a foundation for exploring the specific challenges of achieving equity in archeology.

L'Heritier, Maxime [137] see Dillmann, Philippe

Li, Li [304] see Abdolhazadeh, Aylar

Li, Xin [45] see Ma, Minmin

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**Li, Yingfu**

**[336]** *Mineral Resources and Metallurgical Technologies along the Southern Silk Road*

China's southwest region has vast terrain and diverse landscape with rich mineral resources. From the bronze age to the iron age, this area existed two very obvious metallurgical technology systems, "Central Plains" and "non-Central Plains". The coexistence of two systems is not only the result of "sinification", but also the result of the circulation of metallurgical resource and transmission of technology as social response in the mountainous environment in southwest China.

**Li, Yuqi (Washington University in St. Louis)**

**[3]** *3D Hydraulic Modeling of the Ancient Irrigation System at the MGK Site in Xinjiang, China*

Most archaeologists would agree that ancient irrigation systems preserve important information about the technology, economy, and social organization of past societies. However, considering that archaeologists generally lack training in hydraulics, it is often difficult for us to extract much information from an ancient irrigation system beyond basic description and chronology. Thanks to the recent development in drone technology and flow modeling techniques we now have the option of generating 3D models of ancient irrigation systems and evaluate their hydraulic performance on desktops. In this case study, we demonstrate how these new methods have helped us achieve a deeper understanding of a complicated irrigation system in Xinjiang, China. We further suggest that the application of these methods can be expanded to other areas of archaeology, such as surface surveys.

**Libbon, Jonathan (SWCA Environmental Consultants), Karen Reed (SWCA Environmental Consultants), Aidan McCarty (SWCA Environmental Consultants), Erica Birkner (SWCA Environmental Consultants) and Seth Mitchell (SWCA Environmental Consultants)**

**[85]** *From the Hills of Appalachia to the Shores of Lake Erie: Landscape Archaeology in Northern Ohio*

Northern Ohio is the intersection of several physiographic zones and drainage sub basins. Where the eastern edge of the dissected Allegheny plateau meets the broad till and Lake Plains of western Ohio, the difference in the landscape is apparent. Between 2015 and 2017, SWCA, worked to complete a 217-mile survey across Northern Ohio for a large natural gas pipeline project. The project investigated almost 10,000 acres, and recorded close to 500 archaeological resources. The dataset generated through this extensive survey provides a detailed look at the prehistoric landscape of northern Ohio. When combined with previously recorded sites and the results of other similar linear projects, the information generated by the project provides an excellent data set to compare prehistoric settlement patterns between physiographic provinces as well as identifying key features in the prehistoric landscape. With the increased development of natural gas infrastructure in the region, the authors' hope is to highlight the science being conducted behind the development and to convey the results of the archaeology being performed to the professional community.

Libbon, Jonathan [303] see Reed, Karen

**Lieb, Brad (Chickasaw Nation), Tony Boudreaux (University of Mississippi) and Charles Cobb (University of Florida—Florida Museum of Natural)**

**[119]** *Prelude to the Protohistoric: Late Mississippian Settlement Dynamics in the Central and Upper Tombigbee River Drainage*

This paper examines settlement patterns of the late pre-Contact era (1300–1500 C.E.) in the central and upper Tombigbee River, with a focus on the Blackland Prairie portion. Mississippian and Protohistoric settlement strategies and chronologies are overviewed with an eye toward understanding the coalescence of Contact-era polities and the abandonment of the Tombigbee floodplain. Climatological, sociopolitical, and demographic factors are evaluated. Decentralization as a bottom-up response to resource stress and a strategy of resistance to warfare and exploitation exacerbated by climate change may explain some pre-Contact population movements observed in the archaeological record.

**[194]** *Discussant*

Lieb, Brad [283] see Cobb, Charles

**Liebmann, Matt (Harvard University)**

**[275]** *Second Thoughts on First Contacts in the American Southwest*

The enigmatic first contacts between the Zuni people and Esteban Dorantes, an enslaved Moor, has provided fodder for historical and anthropological speculation for more than 475 years. Conjecture regarding what really happened between Esteban and the Zuni began within a few days of this initial encounter in 1539, and continues down to the present day. Despite centuries of debate, supposition, and guesswork based on scanty historical records, archaeological evidence has yet to be brought to bear on these events. This paper examines what the discipline of archaeology might bring to the study of first contacts throughout the Spanish Empire, comparing the events that occurred at Zuni in 1539 with first contact narratives from the Caribbean and Southeastern North America. It also investigates the implications of First Contact narratives for notions of cultural persistence and contemporary Native American identity in the 21st century.

**Lightfoot, Kent (University of California, Berkeley)**

**[215]** *The Future of Archaeological Research on Public Lands: A Case Study from California*

Lynne Goldstein has been on the front lines in developing innovative field programs for the study of diverse places in North America. This paper examines her influence on archaeological investigations undertaken at the Russian colony of Ross in northern California. A significant trend in the study of sites on public lands is the shift from broad-scale, high-impact excavations to low-impact field practices. The paper outlines her legacy in the development of coordinated research programs that involve museum investigations of older archaeological collections in combination with the strategic use of limited, fine-grained fieldwork.

**Ligman, Michael (Logan Simpson), Tina Hart (Logan Simpson) and Michael L. Terlep (Logan Simpson)**

**[38]** *Portable XRF Analysis of Rock Art Pigments Used in Pictographs across the Great Basin*

Although portable X-ray fluorescence (pXRF) has routinely been used successfully to identify the geochemical source of lithic materials across North America, comparatively few studies apply pXRF to compositional and geochemical sourcing studies of rock art pigments. Logan Simpson conducted exploratory in situ analyses using non-invasive pXRF to analyze the elemental composition of manufactured rock art pigments used to produce prehistoric pictographs at several rock art sites across the Great Basin. Results from these analyses are used to evaluate the potential of this type of analysis within the Great Basin region to: identify the minerals used in pigments; differentiate between pigment types; infer pigment preparation and application techniques; and detect the work of different artists, painting events, and re-touch episodes. GIS was also used to study the relationship between rock art sites and potential sources of pigments.

**Lilley, Ian (The University of Queensland)**

**[145]** *Discussant*

Lima, Mauricio [105] see Latorre, Claudio

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**Lin, Sam (University of Wollongong)****[137]** *Archaeological Science or Scientific Archaeology: Where Does “Science” Lie in Stone Artefact Research?*

Archaeological science is defined as the use of scientific techniques, typically derived from the natural sciences, in archaeology. In lithic research, archaeological science studies have investigated topics ranging from identifying raw material sources, assessing artefact function and technology, to modelling socio-cultural and evolutionary changes. However, this method-centred definition of archaeological science has also led to a focus on the “sciency” appeal of techniques over basic principles of the general science method, namely falsification (“how do I know if I am wrong?”) and validation against uncertainty (“how confident can I be in my explanation as opposed to other explanations?”). Despite the flourish of archaeological science, much of lithic research still operate on analytical units embedded with implicit behavioural assumptions that are difficult to falsify, and a largely common-sensical reasoning process that favours explanations relatable to our modern daily experience. By reviewing other archaeological science approaches, it is argued here that a more explicit discussion of the general science framework is needed in lithic research, with particular concern over the nature of analytical categories, the integrity and confidence of inference, and the ability to objectively evaluate competing causal explanations for the formation of archaeological pattern through multiple lines of evidence.

Lin, Sam [200] see Douglass, Matthew

**Lina, Zhuang (National Museum of China), Lin Liugen (The Archaeology Institute of Jiangsu Province) and Gan Huiyuan (The Archaeology Institute of Jiangsu Province)****[45]** *Ground Stone Tools from the Hanjing and Shunshanji Sites*

The Shunshanji and Hanjing sites are located in the northern part of the middle reaches of the Huaihe River, in Sihong county, Jiangsu Province, China. The two sites date to 8500–7700BP, the middle Neolithic period of China, and the distance between them is about 5 kilometers. Charred rice was recovered during flotation at both sites, and domesticated rice spikelet bases were found in a unit of the Hanjing site. Meanwhile, we revealed some features related to cultivation activities. All the findings suggested that the cultivation of rice emerged in this period. This study examines the subsistence economy and stone-tool production through research into raw material procurement, manufacturing technologies, and the function of stone tools and other stone objects unearthed from the two sites. We also make comparisons with other sites in the same period in China and discuss what role this area played in the origin of rice agriculture in East Asia.

The main methods applied in this research are use-wear and residue analysis for deducing the function of stone tools, and thin-section observations and field survey were conducted for sourcing.

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Linderholm, Anna [212] see Ameen, Carly

**Lindley, Tiffany (The University of Texas at San Antonio)****[28]** *Examining Everyday Lives: Non-Elite Maya Households and the Terminal Classic Collapse*

In this paper I will discuss recent archaeological investigations at the Floodplain North settlement cluster, located within the Rancho San Lorenzo Survey Area in Belize’s Mopan River valley. My research investigates the adaptive responses of non-elite Maya to Terminal Classic (AD 780–900) socioeconomic and political transformations. Preliminary analysis indicates occupation continued at Floodplain North after the Terminal Classic collapse and the abandonment of nearby settlements. Materials recovered from patio groups in the settlement cluster suggest residents exploited the area and its resources over several hundred years, from the Late Classic through the Early Postclassic.

Excavations revealed a large structure with multiple construction phases and possible ancillary buildings. Within the structure, there were three separate interments each with multiple individuals. The burial data suggest the household group utilized the structure over a long period of time, culminating in the Terminal Classic. Preliminary analysis of a similar group in the settlement cluster revealed occupation of the settlement began as early as the Late Classic (AD 670–780). Investigations of Floodplain North provide a detailed look into the everyday lives of non-elite Maya prior to and after the Terminal Classic collapse.

**Lindquist, Shayna (University of Kentucky)****[285]** *Chair*

Lindquist, Shayna [285] see Venter, Marcie

**Lindsay, Audrey (Center for Environmental Management of Military Lands (CEMML)) and Timothy Murphy (Vandenberg Air Force Base—Contractor)****[214]** *The Honda Ridge Pilot Project: Microscopy and Stratigraphy at the Honda Ridge Rock Art Site, Vandenberg Air Force Base, California*

The Honda Ridge pictograph panel contains highly stratified elements painted on a smooth, reflective surface, offering a unique opportunity to explore prehistoric rock art production. We adapted non-invasive, digital microscopy methods from the Shumla Archaeological Research & Education Center to apply stratigraphic analysis within a 1m x 1m section of this superimposed, monochromatic panel. The reflective host rock preserves observable characteristics of prehistoric painting techniques, from brush strokes to finger whorls. By mapping the stratigraphy of these painting techniques, we hope to distinguish painting episodes within a relative layered sequence. If effective during the pilot study, we can apply these methods to the entire rock art panel and develop new questions about ancestral rock art production at Honda Ridge.

Lindstrøm, Torill Christine [34] see Troskosky, Christopher

**Linford, Samantha (The University of Colorado Boulder)****[27]** *Design Analysis, Social Identity and Ancestral Pueblo Migration: Southwest Colorado to Northern New Mexico*

Between PIII and PIV the Southwest saw the largest shift in population from the Mesa Verde region (SW Colorado) to the Northern Rio Grande (N. New Mexico). Traces of this migration are difficult to identify in material culture, but Pueblo oral traditions document the migration from the North and discuss two moieties: summer and winter. My research aims to understand dual division within Pueblo society and whether summer and winter



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moieties can be referenced through ceramic designs before and after the migration to the Northern Rio Grande. Utilizing conceptual metaphor theory, I compare ceramic designs pre-migration in the Sand Canyon and Goodman Point Pueblo communities with designs post-migration in the Northern Rio Grande particularly at Cuyamungue and Tsama Pueblos. My research will investigate whether Tewa moieties emerged pre-migration or not. Several possibilities exist for the origin of Tewa moieties: 1) Tewa moieties emerged from kin-structured moieties (Whiteley 2015); 2) they emerged with great kivas in BMIII (Ware 2014). This research aims to contribute to the knowledge regarding the history of dual organization in this Puebloan tradition through the analyses of pottery designs, guided by ideas concerning the symbolic associations of Tewa moieties and Mesa Verde region pottery.

**Lingle, Ashley (Cardiff University), Nicola Lercari (U C Merced), Arianna Campiani (U C Merced), Manuel Duenas Garcia (U C Merced) and Anaïs Guillem (U C Merced)**

[172] *Terrestrial Laser Scanning and Conservation of At-Risk World Heritage*

Terrestrial Laser Scanning (TLS) is a well-established survey technique in archaeology, architecture, and earth science, which is able to deliver high-fidelity data of surfaces and structures as well as ultra-precise measurements of the morphology of stratigraphic layers. Analyzing and comparing terrestrial laser scanning point clouds captured over time, conservators utilize of an unprecedented amount of quantitative information on the rate of decay of archaeological and built heritage to be used for assessing surface material loss and structural soundness of walls and buildings, underpinning potential causes, and for planning physical interventions. This paper discusses the application of Terrestrial Laser Scanning and semi-automated point cloud data analysis and comparison methods for the conservation of the World Heritage UNESCO site at Çatalhöyük, Turkey. Çatalhöyük is constantly threatened by the fragile composition of its ancient mud brick architecture and the harsh continental climate of its environs, whose salinity is increasing. Specifically, this paper illustrates our preliminary results obtained by comparing surface material loss and volume loss in wall features that were digitally documented in a number of Çatalhöyük East Mound's buildings in the period 2012–2017.

Lingle, Ashley [172] see Campiani, Arianna

Linsin Wohlpert, Sasha [224] see Gibson, Samantha

Linstead, Erik [118] see Walsh, Justin

**Lipe, William (Washington State University)**

[96] *Discussant*

**Lipkin, Sanna (University of Oulu / SUNY at Buffalo), Titta Kallio-Seppä (University of Oulu), Annemari Tranberg (University of Oulu), Erika Ruhl (SUNY at Buffalo) and Sirpa Niinimäki (University of Oulu)**

[9] *Benefits of CT-Scanning in Study of Post-Medieval Funerary Items*

CT-scanning has for long been utilized in the research of mummified individuals, and has been a crucial method used to analyze also northern Finnish mummified human remains. Within Church, Space and Memory -project at the University of Oulu in Finland, eight individuals, mostly children, buried under floor planks of churches have been lifted up with their coffins, and taken for CT-scanning at the Oulu University Hospital. The CT-scans have proved to be suitable also for studying coffins, funerary textiles and associated accessories. This poster will present both benefits and restrictions of this method. CT scans densities of substances and allows analysis of substance surfaces and internal structure. Limitations include separating adjacent substances with similar densities. CT-scanning images for instance reveal tree rings of the coffins, mattress materials, different layers of textiles, and metal artefacts covered by fabrics. In our enquiries we have also micro-CT-scanned individual textiles from archaeological contexts. Micro-CT-scanning enables detailed study of textile structures and sewing patterns. Individually scanned items include caps and knitted products with multiple textile layers that otherwise could not be studied without breaking the items. The greatest benefit of this method is the undestructive research that allows to peek inside textile structures and coffins.

Lipkin, Sanna [25] see Ruhl, Erika

Lipo, Carl P. [156] see Raymond, Tiffany

**Lippert, Dorothy (National Museum of Natural History)**

[337a] *How the NMNH Rises to the Challenge of Using the Best Available Documentation for Repatriation*

The NMNH Repatriation Program is charged under the NMAI Act to use the “best available scientific and historical documentation” to identify the origins of the human remains and objects in its collections. The nature of the museum means that the office can rely on the scholarship of Smithsonian curators for assistance. In addition, copious records in the National Anthropological Archive and in the Smithsonian Archives are present that relate to the collections. However, the records sometimes obfuscate rather than clarify the origins of the collections. Cataloging efforts by the museum have sometimes mixed artifacts that were distinctively organized by the excavator. This paper will illustrate some of the challenges that face the NMNH repatriation program in bringing the best available knowledge to bear on repatriation decisions.

[166] *Discussant*

**Lippi, Ronald (University of Wisconsin), Alejandra Gudiño, Estanislao Pazmiño and Esteban Acosta**

[132] *Incas and Yumbos at Palmitopamba, Tulipe and Other Notable Sites on the Northwestern Periphery of Tawantinsuyo*

Survey and excavation data from the western Pichincha cloud forest of northwestern Ecuador have provided tantalizing evidence of an unusual relationship between Incas and the autochthonous Yumbo populations. The monumental pool site of Tulipe, the terraced hill complex of Palmitopamba, and the pucarás of Chacapata and Capillapamba all provide an extraordinary view of the tentative, late expansion of Tawantinsuyo into the sub-Andean jungle of northern Ecuador. After a dozen seasons of excavation and study in the Palmitopamba locality, we have evidence on Inca-Yumbo craft production, peaceful coexistence, absence of tribute, and a possible Inca refuge from the Spanish, among other information. These results are compiled in this study of Inca-local relations during the final years and at the northern extreme of the Inca Empire.

**Lippiello, Lauren (FCC)**

[73] *Watercraft: The Earliest Temples in Egypt*

Shared iconography and similar functionality associated with dated depictions of Predynastic watercraft and terrestrial shrines identify watercraft as the earliest manifestation of manufactured sacred space in Egypt. The resulting Mobile Sacred Space Paradigm describes watercraft as ritual objects (liminal negotiators) empowered to move through and, thereby, connect three ecologically distinctive landscapes as early as the Naqada IIB Period (and possibly Naqada IC). Results indicate that specific watercraft and their associated paraphernalia represent the earliest temple as the mound of creation, 3250 BCE, a window into the politico-religious foundations of the Egyptian State. The environmental flexibility as well as diachronic endurance of core religious values associated with watercraft suggest strong ideological continuity from the Predynastic through Dynastic Periods.

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**Lira-Lopez, Yamile****[285]** *Aprovechamiento de la obsidiana por la población prehispánica del valle de Maltrata, Veracruz*

El valle de Maltrata se ubica en un punto intermedio de una importante ruta de comunicación, comercio e intercambio entre la Costa del Golfo y el Altiplano Central. Esto permitió que los asentamientos prehispánicos asentados en el valle contaran con la posibilidad de disponer de algunos tipos de artefactos y materiales que no se encontraban en la región cercana.

En cuanto a la obsidiana se refiere, la cercanía con los yacimientos del Pico de Orizaba permiten suponer que durante todo el desarrollo de los asentamientos desde el Preclásico hasta el Posclásico utilizaron esa materia prima para sus herramientas, importante para la vida cotidiana. Sin embargo, su uso como vía de comercio e intercambio, evidencia la presencia de otras materias primas en los artefactos de obsidiana como son los yacimientos de Zaragoza-Oyameles, Sierra de las Navajas, Otumba y Paredón.

Aquí se presenta la distribución de la obsidiana por tipo de artefacto y materia prima, obtenida en la recolección de superficie del valle, y de acuerdo a ello, podemos observar cómo fue utilizada por los distintos asentamientos identificados en el valle.

Lira-Lopez, Yamile [93] see De La Peña Paredes, Juan

**Liss, Brady (University of California, San Diego), Matthew Howland (University of California, San Diego) and Thomas E. Levy (University of California, San Diego)****[68]** *Testing Google Earth Engine for Remote Sensing in Archaeology: Case Studies from Faynan, Jordan*

Satellite imagery and remote sensing have secured a place in the archaeological toolbox, but the scale of satellite derived data often results in large datasets with individual image tiles consisting of many gigabytes. Consequently, performing complex analyses on satellite data can be computationally intensive to a prohibitive degree. Google Earth Engine (GEE), an in-development, cloud-based platform for visualizing/analyzing satellite imagery, affords a solution for researchers with limited access to computational processing power (Gorelick et al. 2017). GEE is freely accessible through a web browser, but analysis is completed on Google's cyber-infrastructure, facilitating rapid analyses on any scale (including planetary). Moreover, through the GEE platform, users can create custom scripts to suit their specific research questions and needs. This paper explores potential contributions of GEE to archaeological research through two case studies. First, GEE was used to automatically identify specific archaeological features across the Faynan region of Southern Jordan. Second, GEE-based edge-detection and automatic vectorization was tested for mapping archaeological sites at the Iron Age (ca. 1200–900 BCE) site of Khirbat al-Jariya in Faynan. Through these trials, GEE proved a viable tool for archaeological research with significant potential to supplement traditional forms of archaeological survey and mapping.

**Liston, Maria (University of Waterloo, Ontario)****[298]** *Exploring the Evidence for Infectious Diseases in Byzantine Thebes, Greece*

The excavation of an early and middle Byzantine cemetery, located in the former Sanctuary of Ismenion Apollo in Thebes, Greece, has provided an opportunity to examine the impact of infectious diseases in post-Classical Greece. The cemetery appears to be associated with a previously undocumented hospital, probably connected with the nearby church of St. Luke the Evangelist. The skeletons were found in rectangular rock-cut graves, all of which contained multiple burials. Two non-standard graves held multiple burials that had been placed in the cutting all at once. We interpret these as mass graves, associated with a catastrophic event, possibly the Justinianic plague. Other graves were used repeatedly, often with much of the upper bodies above the hips being removed prior to subsequent burials. 100% of the graves have multiple individuals with significant bone pathologies. The differential diagnosis of lesions suggests that leprosy was found in approximately 50% of the skeletons, supporting our interpretation that the cemetery is associated with a hospital or hospice. Leprosy appears to co-occur with other infections including brucellosis. Pathogen DNA analysis should help to confirm the diagnosis of these diseases and this project will provide a better understanding of the infectious pathogens that troubled Byzantine Thebes.

**Litschi, Melissa (Southern Illinois University, Carbondale)****[65]** *The Biology and Mythology of Ancestor Lithification in the Andes*

Throughout human history, many cultures have told stories about people who turned to stone in death. What is the inspiration for these myths? How do they relate to taphonomic processes that affect deceased organisms? This paper addresses these questions in an Andean context by comparing pre-Hispanic narratives of lithification to post-mortem biological processes. In the Andes, tales of lithification focus on ancestors and local heroes, who, in their petrified state, continue to interact with the living by mediating between their descendants and supernatural deities. Ethnographies and ethnohistories describe large upright stones (huancas) and natural stone formations (huacas) who received the same care from their descendants as mummified ancestral remains and contextual evidence has allowed examples of modified and unmodified stone huancas to be identified in the archaeological record. The equivalency in the treatment of huancas and mummified ancestors raises interesting questions regarding the conceptual relationship between stone and the dead. One possible explanation argues Andean people were motivated to create this association by the desire to transfer qualities of stone (durability) to their ancestors. However, processes of lithification (fossilization) are not purely abstract mythologies. Could Andean beliefs regarding lithification also represent a compressed and abstracted interpretation of taphonomic processes?

**Little, Barbara (University of Maryland, College Park)****[236]** *Discussant*

Little, Ruth [222] see McGill, Dru

**Liu, Chin-hsin (California State University Northridge) and Coralia Guandique (California State University Northridge)****[56]** *Dental Health Assessment of Nil Kham Haeng and Its Implications in Prehistoric Central Thailand*

Three adjacent, chronologically overlapped, and metallurgically active sites in central Thailand were excavated by the Thailand Archaeometallurgy Project (TAP). This study focuses on dental pathology (caries, calculus, periapical abscessing, antemortem tooth loss, linear enamel hypoplasia) observed on human skeletal remains from Nil Kham Haeng (500 B.C.-A.D. 600) to investigate possible foodways and lifeways of its inhabitants. Among approximately 20 individuals represented, 16 have sufficient dental elements preserved for observation (252 teeth, 145 sockets). When the results are contextualized with another TAP site of Non Mak La and other contemporaneous sites in the region, Nil Kham Haeng shows high prevalence of dental calculus, moderate level of antemortem tooth loss, and negligible to no occurrence for all other indicators. This pattern is consistent with that observed across prehistoric Mainland Southeast Asia. This can be attributable to the consumption of rice and/or millet as staples and broad-spectrum diets. Combined with pending stable isotope analysis, a clearer picture of Nil Kham Haeng dietary pattern will contribute to the poorly understood human lifeways in prehistoric central Thailand.

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**Liu, Siran (USTB), Thilo Rehren (STARC, The Cyprus Institute ; UCL Institute of Archaeology), Wei Qian (University of Science and Technology Beijing), Jianli Chen (School of Archaeology and Museology, Peking University) and Marcos Martín-Torres (UCL Institute of Archaeology)**  
**[137]** *A Complex History of Human-Environment Interaction Revealed by the Study of Metal Production Industries in Imperial China*

The study of technology with archaeological science approaches is a powerful proxy for investigating the history of human-environment interactions and provides essential information which could not be revealed by other types of evidence. This great potential was however not fully exploited in previous works. Here we present an on-going project of archaeometallurgical investigation of 7th-15th century silver-lead production sites in China. Environmental history study agreed that during this period, mineral coal replaced charcoal and became the main fuel of metal industry in China. Our investigation however reveals this is a rather complex and uneven process. In the more arid and densely populated north China coal-fired tubular crucibles were widely adopted in this period. In contrast, the south China smelters continued the more traditional furnace smelting process. More interestingly, crucible technology seems not to be embraced by iron and copper smelters until early modern period. Even in north China, large scale iron smelters still use charcoal rather than mineral coal. This work showcases the power of archaeological study of technology in enhancing our understanding of the complex history of human-environment interactions.

**Liu, Xinyi (Department of Anthropology, Washington University in St. Louis)**

**[336]** *Discussant*

**[336]** *Chair*

Liu, Xinyi [336] see Reid, Rachel

Liugen, Lin [45] see Lina, Zhuang

**Liwosz, Chester (University of California, Santa Cruz)**

**[38]** *Stones and Standing Waves: Integrating Interpretation with Emergent Methods in Petroglyph Studies*

Recent systematic study of petroglyphs and pictographs at select sites in the Great Basin and Mojave Desert explores archaeoacoustic connections between rock art and oral tradition. This project illustrates data collection procedures which integrate emergent, non-impacting methods, with interpretation facilitated by post-positivist thought. Research design is nonetheless framed within the scientific method. Systematic experiments incorporated into this study explore the viability of, and consistency with, a number of previous relevant studies. As the culmination of several field sessions at two dramatic slot canyon sites in Basin / Mojave convergence, results here graphically illustrate dramatic visual and acoustical qualities of potential sacred sites. Relevance of acoustical data is thoroughly substantiated within the contexts of Numic oral traditions linked with place and peoples. Discussion concludes with explanations of how datasets produced here, and elsewhere with comparable methods, may prove useful in addressing other avenues of theoretical exploration, especially archaeoastronomy and its implications.

**Lo, Eric (Cultural Heritage Engineering Initiative, University of California, San Diego), Dominique Rissolo (Cultural Heritage Engineering Initiative, UCSD), Michael Hess (Dept. of Structural Engineering, UCSD), Dominique Meyer (Dept. of Computer Science and Engineering, UCSD) and Falko Kuester (Cultural Heritage Engineering Initiative, UCSD)**

**[134]** *Photogrammetric Techniques for Digital Documentation of Subterranean Maya Architecture*

Photogrammetric techniques are increasingly being used for documenting cultural heritage sites for digital preservation and analysis, but the challenges of working in constrained spaces with difficult lighting conditions have encumbered widespread adoption in subterranean environments. The Proyecto Arquitectura Subterránea de Quintana Roo, coordinated by the Cultural Heritage Engineering Initiative (CHEI), at the University of California San Diego, in collaboration with the Instituto Nacional de Antropología e Historia in Mexico, is conducting a survey and program of digital documentation of cave shrines in Quintana Roo, Mexico. Due to rapid development and population expansion in the area, these sites are increasingly being exposed to the threat of vandalism, necessitating the development of efficient 3D reality-capture tools to fully and accurately document the sites before they are further damaged.

Lo, Eric [248] see Mercure, Danielle

**Locascio, William (Florida Gulf Coast University)**

**[111]** *Tree Island Life: Late Archaic Adaptations of a Northern Everglades Community*

The Wedgworth Midden (8PB16175), a Late Archaic tree island site near Belle Glade, Florida, produced large quantities of faunal remains during excavations undertaken by Florida Gulf Coast University in May of 2016. Analysis of these remains allows insight into patterns of resource acquisition and reveals ways in which people adapted to the local environment. Comparison of proportions of taxa from different occupational periods allows us to trace changes in resource use and sheds light on questions concerning the timing and nature of human settlement in the region and changes in strategies of resource acquisition through time.

Locascio, William [52] see Jones, Kelly

Lock, Gary [29] see Schulting, Rick

**Lockard, Gregory (ERM)**

**[42]** *International Lender Standards for Cultural Heritage*

This paper will provide an overview of international lender standards for cultural heritage and their implementation on development projects throughout the world. The paper will begin with a discussion of the history and objectives of international lender standards for cultural heritage. This discussion will focus on Performance Standard 8 (Cultural Heritage) of the International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability (2012), as the Equator Principles (2013) and many other multilateral lender requirements incorporate the IFC Performance Standards. The paper will then discuss how the standards are implemented by different kinds of development projects in different parts of the world. This discussion will be guided by example projects on which the author has worked in North America, Latin America, Africa, and Asia.

**[42]** *Chair*

**Locke Barton, Angela**

**[179]** *Shards of Medical History: Artifacts from the Point San Jose Hospital Medical Waste Pit*

While monitoring lead remediation activities around historic buildings at Point San Jose (now Fort Mason) in 2010, National Park Service archaeologists discovered thousands of human bones in a medical waste pit behind the former hospital. Large numbers of medical artifacts, primarily medicinal bottle shards, were also recovered from the pit. Many of these medicinal bottles were produced by the U.S. Army Hospital Department for a

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limited time during the Civil War (1862–1865). Such precise manufacturing dates help to firmly establish the terminus post quem for the pit. This assortment of Hospital Department bottles is rare in the archaeological record. Other medicinal bottles, alcoholic beverage containers, administrative supply bottles, food waste, and a few personal items including buttons, tobacco pipes, and one hair oil bottle comprise the remainder of the collection. In addition to establishing a date for the deposit, the specific nature of these artifacts may help to explain why the pit was created, as well as contribute to our understanding of late 19th century military medical practice.

**Lockett-Harris, Joshua**

**[8]** *Caves, Ancestors, and the Underworld: Bedrock Manipulation as a Strategy in the Development of Middle Formative Period Maya Socio-political Complexity, Based on Evidence from Ka'Kabish, Northern Belize*

Growing evidence suggests the ancient Maya conceptualized caves, as well as small crevices in the karstic bedrock (both natural and artificial), as sacred ch'een—portals of shamanic communication, which existed in a liminal realm between the physical world and the ancestral powers of the cave-riddled Underworld. Ch'een represented important ritual foci for the ancient Maya, as well as receptacles for sacred offerings. The interment of prominent ancestors and symbolically valuable materials within natural crevices or artificial bedrock openings—accompanied by ritual commemoration, competitive commensality, and the construction of public ritual architecture—represented a coherent strategy to cement a group or lineage's claim to an area, and legitimize their authority through control of the sacred space thus created. Based on evidence from Middle Formative Period (1000–300 B.C.E.) Ka'Kabish, Northern Belize, this poster will demonstrate that artificial openings in the karstic bedrock of the Maya Lowland were understood through ch'een ideologies of the sacred Underworld, and that the active manipulation of these ideologies served as a catalytic means of transcending existing social ranking in order to create increasingly complex socio-political hierarchies, in a process that would lead to the coalescence of divine Maya kingship, or chulul ahu.

Loebel, Thomas J. [212] see Perri, Angela

**Lofaro, Ellen (University of Tennessee), George Kamenov (University of Florida), Jorge Luis Soto Maguino (Dirección Desconcentrada de Cultura de Ayacucho, P) and John Krigbaum (University of Florida)**

**[282]** *Belonging and Exclusion in Early Colonial Huamanga (Ayacucho), Peru: An Isotopic, Religious and Archival View*

Built in AD 1605, La Iglesia de la Compañía de Jesús de Huamanga is the earliest Jesuit church in modern-day Ayacucho, Peru. Archaeological excavations underneath the church floor uncovered human and faunal remains dating to the 17th and 18th centuries CE. Only indigenous individuals appear to be buried underneath the church floors. Despite significant forced labor practices (mita) at the time, few individuals buried in the church show signs of bodily stress or disease prevalent in those engaged in mining. Beyond the simple and sometimes problematic dichotomy of Spanish and indigenous, it seems likely that additional divisions appeared when considering the application and avoidance of the mita system of forced labor. In addition to bioarchaeological evidence, ethnohistorical documents show that some indigenous Andeans used the Spanish legal system, church service and labor agreements to evade forced labor at the mines. Further, analyses of strontium isotopes reveal that one-third of the individuals were not born locally, correlating with census records documenting rural migration into the city. Indigenous Andeans actively shaped their lives, using migration and manipulation of Spanish religious and legal systems to avoid the harshest occupations, thus moving beyond the stereotypical Black Legend trope.

**Loffler, German**

**[46]** *Digital Standardization of Ceramic Nomenclature: A Case for Central Coast Peruvian Pottery Forms during the Late Intermediate Period*

In this paper, I present a generalized morphological typology for all Central Coast Peruvian ceramic vessels. Today, as in the past, similarly shaped (or in some cases identically shaped) vessel forms have been given different names by different authors, obfuscating another researcher's ability to cross reference ceramic forms rapidly. As publishable material becomes increasingly digitalized and online accessible, it is not hard to imagine a "patch" program that identifies differently named vessel forms and auto-renames the forms to such a generalized morphological typology. The benefits are threefold: standardized typological names in all digital material, ability to access most relevant publications with ceramic vessels of interest, and rapid single word search parameters.

**Loftis, Kat, Alexander Cherkinsky (Center for Applied Isotope Studies, University of) and Robert Speakman (Center for Applied Isotope Studies, University of)**

**[74]** *Evaluating Collagen Pretreatment with XAD Resin*

The presence of exogenous organic carbon is a major concern when radiocarbon dating bone. In particular, the analysis of bone that has undergone diagenesis can be frustrating because the process of humification may potentially introduce contaminant organic carbon. Diagenesis occurs during burial and results from a combination of two distinct processes: (1) reactions involving indigenous organic carbon, (2) the complexation of collagen with soil humic substances. The radiocarbon measurement of altered bone, then, affects the age of the bone and reflects the presence of the exogenous humic carbon. Because the influence of contamination on radiocarbon measurements is dependent on the age of the sample, removal of humic carbon, particularly for older samples, is a necessity for accurate measurement. Pretreatment methods, such as XAD treatment and single-amino acid radiocarbon dating, have been applied to eliminate contaminant carbon and provide a purified sample for dating. In this study, we assessed the effectiveness of XAD for the removal of humics using a controlled study and present suggested modifications to the procedure.

**Logan, Amanda (Northwestern University) and Dela Kuma (Northwestern University)**

**[220]** *Foodscapes as Gendered Landscapes in West Africa*

Food is an integral part of how people interact with landscape, and tasks associated with food production, preparation, and consumption are often strongly gendered. Using gendered taskscapes (Logan and Cruz 2014) as a starting point, we forward the notion of foodscape as a lens through which to see the varied and multi-scalar forms that gender may take on a landscape. Using case studies from both ancient and modern West Africa, we examine how tracing food production, preparation, and consumption helps us recreate archaeological foodscapes and understand the diverse and gendered articulations of taste, labor, and power.

**[237]** *Discussant*

**Lohman, Nicole (Bureau of Land Management)**

**[261]** *Cultural Resources in an Era of "Energy Dominance": Process and Policy for BLM Oil and Gas Leasing*

The Bureau of Land Management's (BLM) mission of multiple use is unique among federal agencies. Managing areas with cultural resources for multiple use is a tricky balancing act of NEPA, NHPA, Native American Consultation, Bureau directives and policy, and Statewide policy. Add public scoping and consulting parties representing the local community and special interest groups and things get even more complicated. This paper discusses the challenges associated with oil and gas lease sales that BLM cultural resource specialists face every year. Landmark and innovate approaches to cultural compliance for lease sales will be discussed including issues associated with the "keep it in the ground" movement, lease sales near national parks and monuments, and the Badger Two Medicine case. How these lease sales have progressed has implications for future lease sales Bureau-wide. A discussion of the December 2017 Lease sale process and results for the Price Field Office will discuss the local implications of national policy and court decisions.

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**Lohse, Jon (Coastal Environments, Inc.)****[59]** *Yuzanu 50, An Early Paleoindian Site in the Mixteca Alta*

Yuzanu 50 was discovered during a reconnaissance of the headwaters of the Yuzanu River as a scatter of debitage eroding from a barranca cutbank, from a palaeosol formed under wet meadows that lined the stream from the Terminal Pleistocene into the Holocene. Excavations exposed 15m<sup>2</sup> of an occupation surface buried 13.5m below modern ground surface. An excavated assemblage consisting almost exclusively of biface reduction debris made of materials that crop out further upstream indicates that this was a short-term occupation with retooling as a primary activity. A broken preform and characteristics of the flaking debris provide indications of reduction strategies. Two informal flake tools and a pair of non-diagnostic bifaces reflect generalized activities. There are few bones, but a long bone diaphysis from a deer-sized animal has cut marks. Radiocarbon dating suggests an age of around 12,750 cal BP. While not extensive, Yuz 50 is among the most securely dated early sites in southern Mexico, and indicates that Pleistocene foragers inhabited high altitude environments, were familiar with local lithic outcrops, and probably used barranca floodplains in their subsistence activities. The large number of megafaunal bones in the same palaeosol complex raises the possibility that these included hunting large prey.

**[59]** *Chair*

Lohse, Jon [59] see Borejsza, Aleksander

**Loiselle, Hope****[10]** *The Historical Ecology of Dolphins and Porpoises off the Oregon and Pacific Northwest Coasts: Contributions from Zooarchaeology*

Wide-scale excavations were undertaken in the middens at Seaside, Oregon in the 1960s and 1970s. However, due to the overwhelming amount of faunal material, much of it remains unanalyzed. This project focuses on the material from the Par-Tee midden (35CLT20). The only cetaceans analyzed from this midden are whales, leaving a knowledge gap about prehistoric human interaction with smaller cetaceans, such as dolphins and porpoises. Using the cetacean comparative and reference collection at the Smithsonian Institution's Museum Support Center, the small cetacean remains have been identified. Species composition and abundance data are compared with modern stranding data to help elucidate whether small cetaceans were actively hunted or if stranded animals were scavenged. Additionally, the small cetacean data from Seaside will be placed into the broader context of small cetacean exploitation in the northeastern Pacific Ocean and compared to data from other archaeological sites. This allows for a temporal and spatial analysis of small cetacean species abundances and distributions in the region. This data is also compared to herring data of the northeastern Pacific, a common food source of small cetaceans, to note if there is a possible correlation between the two.

Loiselle, Hope [195] see Perez, Erina

Loma'omvaya, Micah [218] see Young, Lisa

Longman, Darren [264] see Zborover, Danny

**Loosle, Byron****[261]** *Why We Shouldn't Wait until a Project Is Proposed*

Tribal officials suggest the National Historic Preservation Act should more appropriately be called the National Mitigation Act. For several years we worked to develop policy to direct more effort into identification of areas of cultural concern even before projects proposals were received. We advocated production of appositely designed projects to reduce the amount of adverse effects and mitigation. This effort included encouraging the use of the planning process to assemble data and add protections to important areas. The recent rescission of the Bureau of Land Management's Planning Rule creates challenges in our effort to refocus cultural resource management away from mitigation. In light of current administration policies to open lands for development, what can be done to protect important resources before a project is proposed? We will examine several available options.

**[261]** *Chair*

Lopez, Eos [248] see Blancas, Jorge

**Lopez, Escee (Department of Anthropology, California State University, Los Angeles), Santos Cisceneros (Department of Anthropology, California State University), Shelby Medina (Department of Anthropology, California State University), Jessica Morales (Department of Anthropology, California State University) and Rene Vellanoweth (Department of Anthropology, California State University)****[225]** *Economic and Style Trends of Shell Beads from the Tule Creek Village Site (CA-SNI-25) of San Nicolas Island, California*

Native peoples of Southern California developed complex systems of trades through non-monetary exchanges of items such as beads. Through these exchanges and interactions, socioeconomic structures within intra-local and extra-local communities evolved to fit individual governing societies. The Tule Creek Village was the epicenter of cultural and social development during the Late Holocene on San Nicolas Island. It harbored a myriad bead types distributed among the residential and ceremonial complexes at the site. In this study we analyze the stylistic, spatial, and temporal sequences of beads to understand the fluctuating market trends in the village and interactions with surrounding societies.

**Lopez, Julieta (UNAM), Shigeru Kabata (UDLAP), Tatsuya Murakami (Tulane University) and Manuel Ramirez (UDLAP)****[262]** *Monumental Architecture in Central Mexico during the Terminal Formative: New Findings from the Tlalancaleca Archaeological Project, Puebla*

Tlalancaleca was one of the largest settlements before the rise of Teotihuacan in Central Mexico and has been known for the presence of early talud-tablero facades (a combination of sloping walls and vertical panels) and other cultural elements inherited by Teotihuacan. This paper presents preliminary results of excavations, which were carried at monumental structures at Tlalancaleca. It examines the construction techniques used for monument building (including talud-tablero facades), the degree of urban planning, and the temporal relationship between monumental construction and the urban development based on new radiocarbon dates. Preliminary analysis suggests that monumental construction and reconstruction was heightened during the Terminal Formative period and was associated with urban expansion after the eruption of Popocatepetl around AD 50. While there was no central avenue at Tlalancaleca, we have noted a certain degree of standardization of main axes for monumental building. Such a standardization suggests the integrated nature of several monumental complexes. Finally, we discuss the implications of our findings for better understanding sociopolitical dynamics in Central Mexico during the Terminal Formative.

Lopez, Julieta [262] see Murakami, Tatsuya

**Lopez, Kirsten (Oregon State University) and Brian Haley (Oregon State University)****[265]** *Sourcing Archaeological Textiles in the Northern Great Basin: Evaluation of Baseline Geochemical Data*

Archaeological textiles are by nature ephemeral artifacts, leaving the development of analytical methodologies within the realm of culture history stylistic analysis until recently. Developments in geochemical sourcing methods have opened the window to new forms of analysis, including geographically sourcing the materials with which a textile is made. In particular, strontium isotope ratios with their long-term stability relating to

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archaeological time scales are well-suited for this type of analysis. This purpose of this poster is to take a look at the geographical area of interest, specifically the Chewacaun Basin which is home to Paisley Caves in south-central Oregon, and some of the oldest dated textiles in the Great Basin region. Geochemical data were gathered via surface water sampling throughout the basin and stream tributaries, as well as surface soil and plant samples. These data are presented through Geographic Information Systems to delineate geochemically discreet areas of the basin in preparation for sourcing discarded basketry fragments and textile production waste of the Late Pleistocene and Early Holocene.

**Lopez Bravo, Roberto (Universidad de Ciencias y Artes de Chiapas)**

**[142]** *A Tale of Two Communities: Changing Aspects of Rurality at El Lacandon, Palenque, Chiapas*

Research focused on El Lacandon, a rural community in the outer hinterland of the Late Classic Palenque polity, has allowed the understanding of shifting patterns of relationships between the urban and the rural realms in two specific times: 1) at the end of the Late Preclassic period, when Palenque developed from a rural village into a dynastic capital; and 2) at the end of the Late Classic period, when the ruling dynasty developed new political strategies for hinterland integration.

López Carranco, Karla Itzel [158] see Andrade Pérez, Axel

**López Corral, Aurelio (Instituto Nacional de Antropología e Historia)**

**[31]** *Where Is Camaxtli? Assessing the Iconography of Tlaxcallan Collective Government*

Scholars have acknowledged, for many decades, that Late Postclassic Tlaxcalla (n1250/1300–1519 A.D.) was a state level political entity ruled by a form of collective government having Camaxtli as its main patron deity. Both conceptions are constantly reproduced in academic work although they derive explicitly from sixteenth century historical sources. Unfortunately, few works have undertaken the task of contrasting colonial writings against archaeological evidence in order to test if such information is valid. In an effort to better understand prehispanic Tlaxcallan sociopolitical organization, including the role of Camaxtli as a group unifying figure, this work examines the degree of collective ideology dissemination among the different social sectors by identifying political propaganda in artistic expressions such as polychrome pottery, mural painting, sculptures and figurines. Recognizing artistic depictions of deities, individuals, cargo positions, leaders, or ancestors is relevant to anthropological theory because it can shed light on aspects of the prevalent form of governance, its political orientation, and the ideological traits reproduced throughout the society.

López Corral, Aurelio [31] see Ibarra, Thania

**López López, Alba (Formative Etlatongo Project) and Ricardo Higelin Ponce de León (Indiana University Bloomington)**

**[288]** *Funerary Architecture in Public Space: The Case of Burial 10 at Etlatongo, Mixteca Alta, Oaxaca*

Mesoamerican architecture is characterized by its variety of forms, constructive techniques and functions through time. This can be seen in the Formative pre-urban settlement at Etlatongo, Mixteca Alta, Oaxaca, which was occupied from the Early Formative to the Postclassic period, where among the architectural configurations, we can find structures associated to different human activities.

From all burials founded in public spaces at Etlatongo, we observed that no burial has funerary architecture, with exception of Burial 10. Thus, Burial 10 has architectural characteristics such as a line of stone slabs similar to other funerary architecture pattern in Oaxaca.

It is possible that beyond this funerary structure, considering as a physical element, lies an ideology or reason to be, so Burial 10 could reflected one traceable feature to an organized form of society.

Therefore, this paper will address the relevance of the architecture and characteristics of burial 10, and a brief comparison with the spatial distribution of burials founded in public spaces at Etlatongo.

**López Mazz, José (Universidad de la República, Uruguay)**

**[43]** *Prehistoric Dogs in the Uruguay Lowlands*

This paper presents archaeological information about domestic dogs (*Canis lupus familiaris*) recovered in prehistoric sites in the southeastern lowlands of Uruguay. The presence of dog in the archaeological record is associated to horticultural activities of hunter-gatherers adapted to the very dynamic conditions of this flood ecosystem during the Holocene. Dog findings in mounds have a recurrent and unique association with burials. This context allows a starting discussion on the economic, social, and symbolic/ritual significance of these animals.

**[43]** *Chair*

**Lopez Varela, Sandra (UNAM)**

**[152]** *Discussant*

**Lopez-Finn, Elliot (University of Texas at Austin)**

**[209]** *"A Curious Ambivalence": The Iconography of Long-Distance Trade Goods in Postclassic Mexico*

The Postclassic Mexica maintained what Sophia and Michael Coe (2005) refer to as a "curious ambivalence" regarding cacao: despite its prevalence in everyday life as currency, the plant rarely appears in artistic programs and consumption was highly restricted via sumptuary laws that controlled social behavior. The visual scarcity of this crop extends into divine imagery—for instance, cacao remained an important aspect of Ek' Chuah, the Postclassic Maya merchant god, but does not appear among the connotations of his almost-identical Mexica counterpart known as Yacatecuhtli. This disconnection between visual versus economic consumption resonates with ethnohistorical evidence of an anxiety over cacao due to its luxurious and foreign nature—and by extension the larger tensions inherent in relationships with long-distance trade goods. In this work, I examine not only what foreign goods appear in the visual vocabulary of the Mexica, but the connotations of 'place' in their artistic contexts. In addition, I argue that the dearth of cacao iconography reflects larger tensions. As the Mexica expanded the boundaries of their empire in search of foreign products, the imperial artistic program broadcasts a complicated narrative of a people wrestling with identity in the face of increasing connections with far-flung places.

**[209]** *Chair*

Lord, Edana [51] see deFrance, Susan

Lordkipanidze, David [41] see Coil, Reed

Lorenz, Samantha [134] see Layco, Wendy

**Lothrop, Jonathan (New York State Museum) and Christopher Ellis (University of Western Ontario)**

**[120]** *Fluted Point Variation in Glaciated Northeastern North America*

Recent syntheses for the adjacent glaciated regions of the eastern Great Lakes (EGL) and New England-Maritimes (NEM) document similar fluted point sequences associated with early and middle Paleoindian populations. Current consensus holds that these fluted biface sequences fall within a time range of 13,000–11,600 calendar years before present, and probably derive from Clovis populations (or their immediate descendants) that

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colonized the glaciated landscapes of the Northeast from west and south. Here, we (1) discuss ongoing analyses of collections that provide additional insights on stylistic and technological variation through time in the glaciated Northeast, (2) draw comparisons with Clovis biface reduction sequences and forms, and (3) consider implications for the developmental relationships of these northeast fluted biface sequences to Clovis point technology.

**Loubser, Johannes (Stratum Unlimited, LLC)**

**[113]** *The Transformational Properties of Water and Rock Art*

Water helps breach the rock surface in both physical and perceptual ways. The addition of water facilitates the production of petroglyphs not only by weakening the bond between particles in sedimentary rocks but also with the moist particles acting as an effective abrasive slurry. The addition of water to natural earth pigment powder allows the colorant to effectively enter pores and interstices. Many virtually invisible petroglyphs and pictographs "magically" appear when covered with a thin layer of water. Southeastern Indians stood on damp surfaces or were partly submerged in water when producing petroglyphs. They also purified in rivers prior to major undertakings, such as producing or visiting petroglyphs. Numerous accounts mention these Indians entering the domain of spirit beings behind the rock surface through a waterfall or river pool. Some still believe that ocean and spring water are connected and practice rituals where ocean water is poured over a petroglyph boulder to animate its surface and to mix potent medicines from different realms.

**Loucks, Jordon (University at Albany) and Jessica Watson (University at Albany)**

**[331]** *Preservation in Peril: Patterns of Politics and Archaeology over the Past 100 Years*

In an era of uncertainty in the significance of cultural resources, an evaluation of the history of legislation that protects and manages effects on cultural resources is of paramount importance. At the federal level, the environmental policies that ensure evaluation of cultural resources are at risk in today's political climate. To understand how to best maintain and improve protections and mechanisms of cultural resource investigation, the following paper evaluates the history of cultural resource law in the political environments in which they were created, and provides suggestions for activism that could be employed to continue to refine cultural resource law in the twenty-first century. Archaeologists have a responsibility to improve resource evaluation and provide updated mitigation strategies in the face of an anti-environmental political landscape.

**Louderback, Lisbeth (Natural History Museum of Utah, University of Utah), Nicole Herzog (Boise State University), Bruce Pavlik (Red Butte Garden, University of Utah) and Tom Dillehay (Vanderbilt University)**

**[86]** *Re-evaluating the Earliest Evidence for Wild Potato Use in South-Central Chile*

The earliest evidence of wild potato use anywhere in the world comes from Monte Verde (southern Chile), where tuber fragments were recovered from hearths that directly date to 14,500 cal B.P. Those tubers were tentatively assigned to a wild potato species (*Solanum maglia*) based on their starch granule morphology, which, according to Ugent et al., could be distinguished from the granule morphology of the domesticated potato (*S. tuberosum*). Recently, that identification has been called into question by Spooner et al., correctly pointing out that there is considerable variation in the size and shape of starch granules. This project extends this work by conducting a systematic study of starch granules from tuber reference materials of *Solanum* species that occur within a few hundred kilometers of Monte Verde. All reference materials were obtained from the USDA/ARS Potato Genebank and the International Potato Center and include *S. chacoense*, *S. kurtzianum*, *S. maglia* and *S. tuberosum* subsp. *andigenum*. We will present our approach to starch granule identification, clarifying whether the critical diagnostic features used by Ugent et al. allow with certainty an unequivocal assignment of the Monte Verde archaeological tubers to a single species.

Louderback, Lisbeth [86] see Herzog, Nicole

Love, Michael [95] see Lawrence, John

**Lovis, William (Michigan State University)**

**[215]** *Landscape Marking, the Creation of Meaning, and the Construction of Sacred and Secular Spaces: Rethinking the Birney "Mound" in the City of Bay City*

The so-called "Birney Mound" on the Saginaw River in lower Michigan is revisited from the vantage point of long term landscape perception, marking, naming, and memory. The natural raised postglacial beach feature, a deposit of light sand, is the major landscape prominence on the Saginaw River drainage. At times during high water stands in the basin the location was the entrepot to the system from Lake Huron, and during later recessional episodes became the first highly visible landform encountered in upstream travel. The "mound" was employed for ritual purposes and cumulative mortuary behaviors for 5000 years. As recently as the late 18th century it harbored a Native American cemetery, and during the early 19th century it continued its prominent role of place as the site of major treaty negotiations. Such continuity of use reifies its status as a persistent place with attached and transmitted intergenerational information, and potentially transcending specific named ethnic/tribal groups; it is a cumulative historical space. This rethinking of the Birney "Mound" clearly situates the locale as a multigenerational landscape anchor point in indigenous knowledge and wayfinding systems.

Low, Marika [41] see Pargeter, Justin

**Lowe, Lynne (Centro de Estudios Mayas, UNAM)**

**[176]** *Chiapa de Corzo: rutas de intercambio e interacción cultural entre las regiones zoque y maya*

Chiapa de Corzo se distinguió como una de las principales capitales zoques en la Depresión Central de Chiapas por casi dos milenios, hasta su abandono a finales del periodo Clásico. Su localización sobre una meseta elevada, que dominaba el valle del río Grande o Grijalva, resultó estratégica en el control de una de las principales vías de comunicación y transporte de recursos entre la costa y las tierras altas mayas. El sistema de comunicaciones asociado al río Grijalva constituyó el eje de una de las rutas de mayor importancia desde tiempos prehispánicos, con diversas conexiones fluviales y terrestres. La región destacó por su producción de cacao, maíz, algodón, ixtle, copal y otros productos vegetales, además de plumas preciosas y minerales apreciados, como la ilmenita, el caolín, la sal o el ámbar; asimismo, era la ruta de entrada para bienes foráneos sumamente valorados, como la obsidiana y la jadeíta, que llegaban desde el altiplano guatemalteco. El estudio de diversos contextos arqueológicos funerarios y rituales excavados en Chiapa de Corzo han aportado información fundamental para establecer la existencia de rutas de intercambio e interacción con el área maya desde el periodo Formativo Medio.

**Lowery, Darrin (Chesapeake Watershed Archaeological Research)**

**[79]** *A Chesapeake Bay Paleoindian Legacy: Marine Transgression, Shoreline Erosion, and Archaeology*

The Chesapeake Bay at present encompasses approximately 4,479 square miles of estuarine water and it contains almost 12,000 linear miles of coastline. Numerous archaeological sites occur along the margins of the bay and its tributaries. Thousands of these sites are regularly threatened by the daily onslaught of wind and wave activity. The Delmarva Peninsula, which encompasses the eastern margins of the bay, has revealed approximately 350 Clovis-style fluted projectile points. Later and potentially earlier Paleo-American sites have also been discovered. Most of these sites and their associated assemblages have been found along the actively eroding shorelines of the peninsula. The purpose of this paper is to

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highlight the natural coastal erosion threats observed at several Paleoindian sites and to offer simple solutions to address the loss of these important sites. A few of these rapidly disappearing sites have been partially investigated over the past 35 years and offer unique insights into regional Paleoindian adaptations.

[159] *Discussant*

**Lowman, Christopher (University of California, Berkeley)**

[305] *Many Ways of Working: Archaeological Methods at the Arboretum Chinese Quarters, Stanford, California*

Farmers, gardeners, builders, cooks, janitors, launderers, restaurant-owners: the Chinese diaspora community in nineteenth century Stanford, California, was made up of men, and a few women, who took on many ways of working to support themselves, their families, and their communities. Their integral role in the development of the Bay Area's infrastructure is sometimes obscured because of systematic exclusion, destruction, and erasure in the late nineteenth and early twentieth centuries. Because of this, sites outside of major urban centers are often invisible. However, using a combination of oral history, archival research, and archaeological methods including remote sensing, survey, and excavation, the Chinese Arboretum Quarters project pieced together the way a Chinese community, outside of a Chinatown, lived, worked, and survived in an era of racialized immigration restriction.

Lowry, Justin [18] see Paling, Jason

**Lowry, Sarah (New South Associates, Inc.), Shawn Patch (New South Associates, Inc.) and Lynne Sullivan (University of Tennessee)**

[286] *The Works Progress Administration, Tennessee Valley Authority, and Geophysics: Bringing Together Digital Geophysical Data and Historic Excavation Results for Comprehensive Data Sets*

Under contract with the Tennessee Valley Authority (TVA), New South Associates, Inc. conducted comprehensive geophysical surveys of five Mississippian sites in the Tennessee River Valley between 2013 and 2017: the Bell Site (40RE1), the Cox Mound (1JA176), Hiwassee Island (40MG31), Ledford Island (40BY13), and Long Island (40RE17). The Works Progress Administration (WPA) conducted salvage excavations on all of these sites in the 1930's and the information available from their notes and limited reporting were the primary data sets used to study these sites prior to the geophysical survey. These notes and maps were often lacking detailed narrative and none of the maps could be georeferenced. The geophysical surveys expanded on these earlier data sets to survey the entire landscape, but comprehensive excavations could not be conducted. Combining the results from the geophysical surveys with those from the WPA surveys has brought the scanned legacy data into the digital world. The complementary data sets provide a more detailed understanding of each site's archaeology across nearly 100 years of research.

**Lozada, Maria (University of Chicago), Kristie Sanchez (Washington University in St. Louis), Rex Haydon (University of Chicago Hospitals), Hans Barnard (Cotsen Institute of Archaeology) and Augusto Cardona (Centro de Investigaciones Arqueológicas de Arequip)**

[335] *The Ramada Mortuary Tradition: At the Crossroads of Nasca and Wari in the Vitor Valley, Southern Peru*

In this paper, we discuss the mortuary tradition affiliated with the Ramada communities that inhabited the Vitor Valley of Southern Peru around 550 CE. Our field excavations in 2012 and 2015 revealed a long-standing tradition of mortuary treatment that persisted even after the arrival of the Wari in the area. While many components of this tradition appear to have originated locally, other components closely parallel Nazca populations, including patterns of trauma, funerary ritual and the presence of "trophy heads". The collective nature of the burials suggests the inclusion of both sexes, and all age groups. Interestingly, we have detected a form of secondary burial for neonates and infants. Our data suggest that many of them were not buried at the time of death, but rather at a later time, positioned next to adult women. In this context, we argue that the Ramada mortuary tradition in the Vitor Valley was part of a long-standing practice that remained remarkably unchanged despite co-habitation of the Valley with altiplano populations, and that promoted ongoing communication between the living and the dead. These collective burials may point to social and/or biological units that were perpetuated even after death.

Lozada, Maria [335] see Barnard, Hans

**Lozano, Stephanie (University of California, Riverside)**

[33] *Teotihuacan References Found within Classic Maya Inscriptions*

This paper explores Teotihuacan references found within the corpus of ancient Maya inscriptions. Classic Maya inscriptions analyzed for this investigation were derived from monumental architecture to ceramics. In the last decade more references to Teotihuacan within Classic Maya hieroglyphic writing have surfaced within the archaeological record and in museum collections. However, recently there has not been an in-depth study that analyzes the context of these recently uncovered references. First, this paper reanalyzes previous studies of the aforementioned topic. Second, it examines recent Teotihuacan references found within Classic Maya inscriptions which reveals new insights to the relationship that existed between the Classic Maya and the ancient city of Teotihuacan from Central Mexico.

**Lozano, Sergi (IPHES), Luce Prignano (University of Barcelona), Francesca Fulminante (Cambridge University) and Ignacio Morer (University of Barcelona)**

[146] *Network Models for the Emergence of Transportation Infrastructures in Central Italy (1175/1150–500 BC ca)*

The period between the Late Bronze Age and the Archaic Age is a time of change and development in the Italian Peninsula, leading to the formation of the first city-states.

In this study, we focused on the Tyrrhenian regions of Latium Vetus and Southern Etruria, by analyzing the emergence of the network of terrestrial routes as it has been inferred from archaeological evidences. Our goal was to explore the mechanisms that shaped the overall structure of these past transportation infrastructures.

To this end, we designed network models corresponding to three competing hypotheses about the dominant mechanism underlying the creation of new connections. After comparing several synthetic networks generated by those models with the corresponding empirical systems, we obtained different outcomes for each of the two regions. In the case of Southern Etruria, the model simulating a simple form of cooperation was able to accurately reproduce all the relevant features of the network for the whole period under study. On the contrary, for Latium Vetus, each model could reproduce only some of the features at some of the ages. However, if we add a "rich get richer" bias to the cooperative model, its performance improved significantly.

**Lozano Bravo, Hilda (UNAM, Estudios Mesoamericanos.), Jose Luis Ruvalcaba (Instituto de Fisica, UNAM), Ana Maria Soler (Instituto de Geofisica, UNAM) and Luis Alberto Barba (Instituto de Investigaciones Antropologicas, UNAM)**

[89] *Floors, an Archaeological Material: The Case of the Plaza de la Piramide del Sol, Teotihuacan, Mexico*

Human beings have modified surfaces to make them habitable, with time they made other floors to give it a better finish. The process was recorded in the floors interiors; we can observe the materials used in its elaboration and how they changed through time. Additionally, we can conduct other studies which help us understand the time-frame between structures. Floors are a complex material and their study helps us identify social aspects seen in



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past studies of other materials such as ceramics, architecture, among others.

In this investigation we employed archaeomagnetic, chemical, geological, and six non-destructive physical analyses. Moreover, these studies were performed on fragments from three kinds of floor that correspond to distinct surface levels found in southern sector of Plaza de la Piramide del Sol, Teotihuacan during the 2014 excavation season.

Finally, we will present results gained from FTIR, XRD, and Raman analyses, from unconsolidated samples, SEM consolidated block sample studies against unconsolidated samples—as well as thin section findings. We will close by presenting archaeomagnetism dating results from which four construction periods were identified—as well as the benefits and drawbacks of using this methodology on a floor with the particular physical characteristics possessed by the analyzed Teotihuacan floors.

### Lu, Hongliang (Sichuan University)

[336] *Discussant*

[336] *Chair*

### Lucas, Virginia (University of Nevada, Las Vegas) and Levent Atici (University of Nevada, Las Vegas)

[187] *Faunal Exploitation Practices at the Steve Perkins Site, a Lowland Virgin Branch Puebloan Site Located in Southern Nevada*

To date, there has been little research conducted concerning the faunal exploitation practices of the Lowland Virgin Branch Puebloans in Southern Nevada. This project examines faunal remains from the multi-component Steve Perkins site, which was occupied from the Basketmaker II period (A.D. 400–800) to the Pueblo II period (A.D. 1000–1150). This project aims to provide insight into the subsistence strategies and exchange economies of the Lowland Virgin Branch Puebloans. By identifying the faunal remains, subsistence practices and exchange networks are evaluated. With transitions from the more mobile Basketmaker II period to the sedentary Pueblo II period, faunal assemblages are expected to shift to reflect the more sedentary lifestyle.

### Lucero, Lisa (University of Illinois at Urbana-Champaign)

[213] *Introduction to the Intersection of Sustainability and Climate Change in Tropical Social Systems*

In 2015 world leaders adopted the United Nations 17 Sustainable Development Goals detailed in The 2030 Agenda for Sustainable Development. Recently, policy makers, archaeologists and other tropical scholars have been working with UNESCO Mexico, focusing on sustainability in tropical regions. One of the session discussants, Dr. Nuria Sanz, Director of UNESCO Mexico, has laid out the key aspects of particular important to tropical areas, resulting in the focus on five of the 17 goals: Goal 6—Ensure availability and sustainable management of water and sanitation for all; Goal 12—Ensure sustainable consumption and production patterns; Goal 13—Take urgent action to combat climate change and its impacts; Goal 15—Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss; and Goal 16—Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels. In this this paper, I discuss how archaeological data on ancient tropical societies can assist in devising strategies to address goals, with a particular focus on addressing the intersection of climate change and sustainability.

Lucero, Lisa [85] see Larmon, Jean

### Lucet, Genevieve (IIE-UNAM) and Irais Hernández (Instituto de Investigaciones Estéticas, UNAM.)

[172] *About the Reliability of Archaeological Information*

To study Mesoamerican architecture and urbanism, their graphic description is required. This description must be accurate, and it is traditionally expressed in coded and scaled drawings.

For decades, archaeologists have produced extensive documentation of their excavations, which institutional services in charge of the registration of monuments have supplemented to obtain complete inventories in order to support conservation and restoration activities. However, this material has been generated with recording methods where human intervention was important and indispensable to define quality. These data were then represented by line drawings and scaling of the initial measurements. Many times, the material that comes to us has been drawn, traced, digitized and printed. In other words, to the initial errors, many more were accumulated that diminishes the precision of the representation.

I will compare the quality of the information generated a few years ago with the documentation obtained from an aerial photogrammetry survey. I will develop the problem of human intervention in the registering vs. automated systems and the exhaustive representation vs. traditional planimetry. I will speak about the problem of reliability of data in order to share information in a wide digital context.

Luchsinger, Heidi [265] see Mazow, Laura

Lucidi, Maria Rosa [29] see Colantoni, Elizabeth

Lucquin, Alexandre [50] see Admiraal, Marjolein

### Ludaescher, Bertram (University Illinois, Urbana-Champaign)

[279] *Discussant*

### Ludlow, Mark and Michael K. Kehoe (President—Northern Shenandoah Valley Chapter of)

[67] *On Finding Smoke Town, a Late Eighteenth to Mid-Nineteenth Century, Rural Free Black Community Populated in Circa 1791 by Some of the 452 Manumitted Slaves of Robert Carter III*

This paper discusses the findings of initial excavation of a portion of the elusive rural free black community cartographically known as Smoke Town or Leeds Town, situated on the Shenandoah River, Warren County, Virginia. This community was populated by some of the 452 slaves manumitted by Robert Carter III by his Deed of Gift of 1791. Robert Carter III was an affluent grandson of Robert 'King' Carter. This Deed of Gift was the largest single manumission of slaves in America until the American Civil War—an event, of which few are aware. The excavated portion of Smoke Town dates from late eighteenth to the mid-nineteenth century. There are also prehistoric components to the site from the Late Archaic and the Early Woodland periods: An Early Woodland prehistoric hearth was found partially within the historic period fireplace and below the historic period chimney foundation. The physical evidence of the site is introduced and the excavation procedures and results used in the interpretations are presented. Discovery came as the result of two archaeological metal detecting surveys, reconnaissance and systematic. Excavations illuminate manners in which newly freed slaves of African descent conducted their lives, in contrast to plantation slave lifeways.

Lueth, Friedrich [190] see Ruby, Bret

Luiza da Silva, Viviane [206] see Feest, Christian

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**Lukezic, Francis (Maryland Archaeological Conservation Laboratory)**  
[149] *Discussant*

**Lulewicz, Isabelle (University of Georgia), Neill Wallis (Florida Museum of Natural History) and Victor Thompson (University of Georgia)**  
[35] *Village Aggregation and Native Subsistence Practices at a Middle Woodland Mound Center, Gulf Coast Florida, USA*

Current research at Garden Patch (8DI4), a Middle Woodland mound center with circular village construction in northern peninsular Gulf Coast Florida, provide quantitative insights into the timing and temporality of monument construction and village aggregation. Here, we combine previously modelled radiocarbon assays with new isotopic data on season of collection and habitat of exploitation. The four-phase model of site occupation when combined with the new isotopic data provide new insights into the relationship between Native subsistence practices and rapid village construction events.

Lulewicz, Isabelle [222] see Speakman, Robert

**Lulewicz, Jacob (University of Georgia)**

[83] *Multilayer Networks and Relational Plurality: The Scales and Sources of Social Capital across Southern Appalachia, A.D. 1150–1350*

The scale and structure of the relationships through which social capital is generated, amassed, and controlled must be understood if we are to evaluate the emergence and evolution of organizationally complex social, political, and economic institutions. At any one point in time however, actors or entities are undoubtedly embedded and engaged in a number of distinct, yet overlapping, relational fields. In this paper I interrogate three networks, representing three separate sets of relationships, situated at local, regional, and continental scales, to investigate the emergence of Etowah as a major sociopolitical center in the Southern Appalachian region of the southeastern United States. It is often posited that processes of Mississippianization are tied to shifts in political strategies towards those that emphasize exclusive relationships and the emergence of elite networks. While these extant narratives often focus on the actions of individual leaders or the characteristics of particular communities, this paper quantifies the actual scale and organization of these emerging relational structures and the effects of these structures on the distribution of social capital across Southern Appalachia. Using data on ceramic production and regional signaling behaviors I evaluate the plurality of network strategies through which different kinds of social capital were accessed.

**Luley, Benjamin (Gettysburg College)**

[170] *Money and Inequality in Roman Mediterranean Gaul, ca. 125 B.C.–A.D. 100*

The Roman conquest of Mediterranean Gaul between 125–121 B.C. significantly altered the Celtic societies living in the region. Two of these dramatic transformations were the increasing use of coins in economic transactions, and a marked rise in socio-economic inequality within the conquered province. This paper examines the connections in Roman Mediterranean Gaul of the first century B.C. through the first century A.D. between the emergence of a monetized economy, debt, and increased socio-economic hierarchy, concentrating on the ancient settlement of Lattara (today modern Lattes in the région of Occitanie of France). Although coins, mainly from the Greek colony of Massalia (modern Marseille), were already present before the conquest, their use appears to have been limited. After the Roman conquest, the (at least partial) monetization of the local economy at Celtic settlements in Roman Mediterranean Gaul like Lattara significantly transformed notions of wealth and value, with a new interchangeability of wealth emerging. Combined with the colonial trauma of land confiscations and enslavement, this interchangeability of wealth allowed for the increasing concentration of wealth in an increasingly smaller number of individuals, holding ever more social power of others.

Luna, Leandro [105] see Peralta, Eva

**Luze, Meredith**

[337a] *Applying pXRF Technology to Repatriation at the National Museum of Natural History*

The Anthropology collections at the National Museum of Natural History (NMNH) have a long history of treatment with pesticides and contact with other materials that contain potentially hazardous elements. When the NMNH Repatriation Office began to use portable x-ray fluorescence (pXRF) technology, it focused on identifying potentially hazardous elements on archaeology, ethnology, and physical anthropology collections. If identified, the Repatriation Office attempted to determine the source of these elements, particularly from substances used and applied by the original makers and users of the objects and from substances applied during their curation. The Repatriation Office has since expanded the application of pXRF beyond hazardous materials testing, working with tribes to find new ways to address questions and meet their needs for and beyond repatriation. To date, pXRF has been used to assist in dating sites and human remains by analyzing metal alloys, to attempt to reassociate human remains with funerary objects, to reassociate commingled human remains, and to source artifacts and human remains. Many of these approaches have been undertaken at the request of tribes and have now been incorporated into the standard documentation process for all objects and human remains requested for repatriation.

Luzzadder-Beach, Sheryl [153] see Wendel, Martha

**Lyall, Victoria**

[206] *Connecting Collections: The Ancient Americas in American Museums*

Museum collections resemble the tastes and character of the donors and curators that assembled them. This subjectivity lends them an idiosyncratic character. Nevertheless, the early network of dealers and donors connects many museums across the United States. Institutions like the Saint Louis Art Museum and the Denver Art Museum, for example, are linked through such relationships. This paper examines the history of such relationships and the manner in which collection histories may shed further light on the development of pre-Columbian art in the United States. Museums played an essential role in the popularizing of the Americas across the United States both through the growth of their collections and exhibitions. This paper will consider specifically the Denver Art Museum's (DAM) collection, and the role early directors and curators played in its development.

Lyle, Robin [95] see Schleher, Kari

**Lynch, Joshua (Center for the Study of the First Americans)**

[250] *Assessing Variability in Toolkit Functionality: Differential Wear Patterns on Projectile Technologies from Late Pleistocene/Early Holocene Interior Alaska*

Much of the early theoretical framework for our understanding of the colonization and occupation of interior Alaska has been established on technological variability in lithic assemblages of the region. This initial research has been limited in scope, focusing on the presence or absence of microblades. Recent research has sought to push beyond the significance of debatably diagnostic tool forms, microblades, in defining cultural complexes and has attempted to more fully address models of behavioral variability including mobility, lithic landscape learning, seasonality, site-specific or prey-specific variability, and raw material constraints. Comprehensive inter- and intra-site use-wear studies represent a promising avenue for better understanding the functionality of important elements of lithic tool kits. This paper presents a morphological, macroscopic, and "low-power" microscopic usewear analysis of bifacial projectile points and microblades from 15 late Pleistocene/early Holocene sites located in interior Alaska

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designed to more accurately define the functional roles and differential use of these technologies at an intersite and intrasite level. After establishing the functional roles of specific lithic projectile elements and point types, archaeologists can improve interpretations of late Pleistocene/early Holocene assemblage variability, especially as it relates to foraging behavior, landscape use, and site function.

Lynn, Christopher [168] see Stewart, Ashley

**Lynnerup, Niels (University of Copenhagen), Damgaard Peter (Centre for GeoGenetics, Natural History Museum), Hansen Henrik (Centre for GeoGenetics, Natural History Museum), Morten Allentoft (Centre for GeoGenetics, Natural History Museum) and Ashot Magaryan (Centre for GeoGenetics, Natural History Museum)**

[143] *We just need a few milligrams...*

Destructive analyses of human remains, i.e. analyses dependent on small biological samples from human, archaeologically found, bone or teeth, have yielded important new data and added to knowledge about our past. Yet, more studies generate even more studies, and the demand is clearly rising for more samples made available. This is especially the case for those collections, which are very unique in terms of geography (Greenland) or time period (Danish mesolithic). At the same time, these unique collections also represent a limited resource; it is doubtful how many more Greenlandic or Danish Mesolithic skeletons will be found in the future.

Aside several major studies on Danish prehistory, we have also undertaken exploratory "proof-on-concept and feasibility" studies, and methodological studies, comparing different sampling techniques. The presentation will focus on sampling techniques over the last twenty years, describe the rising curatorial awareness of the implications of sampling, including ethical considerations, as well as the results of our methodological studies.

**Lyon, Jerry (Tierra Right of Way Services, Ltd.), Barbara Montgomery (Tierra Right of Way Services, Ltd.) and Jeffrey Jones (Tierra Right of Way Services, Ltd.)**

[325] *Deciphering the Dairy Site: Settlement Dynamics and Early Hohokam Developments*

The Dairy site is a long-lived prehistoric locality situated at the juncture of the Tortolita Mountains piedmont and the Santa Cruz River floodplain north of Tucson, Arizona. Although the site has yielded important evidence of early Hohokam settlement and cultural developments, the sporadic nature of investigations, the lack of data from early fieldwork, and the destruction of significant portions of the site by the original Shamrock Dairy operation provide substantial challenges to understanding the occupational history and structure of this important prehistoric locality. Since 1999, archaeologists with Tierra Right of Way have investigated much of the locality and revealed extensive loci dating from the Tortolita through early Hohokam (Snaketown and Cañada del Oro) phases. This paper synthesizes previous and on-going research at the site to address the emergence of a local Hohokam tradition in this unique locality. We contrast early Hohokam cultural developments at the Dairy site with the plaza-centric village-based developments identified elsewhere by highlighting alternate agricultural strategies, settlement dynamics, and ideological and mortuary patterns.

[325] *Chair*

**Lyons, Patrick (Arizona State Museum), Don Burgess (Arizona State Museum), Marilyn Marshall (Arizona State Museum) and Jaye Smith (Arizona State Museum)**

[218] *New Perspectives on the Maverick Mountain Phase Roomblock at Point of Pines Pueblo*

Emil Haury's 1958 synthesis of the Pueblo III-Pueblo IV period (A.D. 1265–1450) archaeology of Point of Pines Pueblo, in east-central Arizona, is the US Southwest's classic case study in how to reliably infer ancient migrations. Field school excavations conducted between 1946 and 1960 uncovered compelling traces of immigrants from the Kayenta region of far northeastern Arizona and southeastern Utah. Noting evidence of a fire in the part of the pueblo referred to as the Maverick Mountain phase roomblock, and the rarity of Maverick Mountain Series pottery in deposits post-dating the conflagration, Haury concluded that the locals at Point of Pines burned these rooms in order to drive the Kayenta immigrants out. Recent research with the site's collections and their associated records has revealed indications of ritual architectural closure behavior similar to that documented at the Homol'ovi villages, a key indicator being enriched deposits. The nature of these deposits suggests that, rather than the locals, the immigrants set fire to the roomblock. In this paper, we describe this new evidence and consider the implications for understanding interactions between locals and immigrants at Point of Pines.

[280] *Discussant*

Lytle, Whitney [173] see Cap, Bernadette

**Ma, Minmin (Lanzhou University), Lele Ren and Xin Li**

[45] *The Study of Isotopic Baseline in the Gan-Qing Region, Northwestern China*

We analyzed the baseline for dietary study through stable isotopes in the Gan-Qing (Gansu and Qinghai provinces) region in prehistory. Total 283 animal samples from 4 sites were collected and analyzed. We found that herbivorous  $\delta^{15}\text{N}$  values did not change much in the Hehuang region between 3200 BCE and 2000 BCE, indicating that the range of nitrogen isotopic baseline was relatively stable in different time. The range of herbivorous  $\delta^{15}\text{N}$  values from the Hehuang region around the 2000 BCE is from 1‰ to 6‰. The herbivorous  $\delta^{15}\text{N}$  values from the Hexi Corridor varied from 2‰ to 10‰. This result shows that the nitrogen baseline in the Hexi Corridor was higher than that in the Hehuang region. It is probably related with the drought climate in the Hexi Corridor. The results indicate that isotopic baseline is particularly important for dietary research using stable isotopic methods in northwestern China.

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**Macdonald, Danielle (University of Tulsa) and Lisa Maher (University of California, Berkeley)**

[4] *Every Block of Stone Has a Statue Inside: Epipalaeolithic Engraved Plaquettes and Art at Kharaneh IV*

Artistic objects are thought to be one of the hallmarks of the Natufian period, marking a florescence of artistic behavior appearing prior to the origins of agriculture. However, with continuing research into Early and Middle Epipalaeolithic sites in the Levant, new discoveries of 'symbolic' artifacts are increasing our understanding of even earlier artistic and symbolic pursuits. In this paper we present an engraved plaquette from the Middle Epipalaeolithic context of Kharaneh IV, eastern Jordan. Using white-light confocal microscopy, we analyze manufacturing traces to identify the gestures and tools used to create the plaquette. This artifact, although the only engraved piece recovered from Kharaneh IV thus far, links into wider networks of Epipalaeolithic interaction and cultural exchange. Placing the Kharaneh IV engraved object into regional context with other Early/Middle Epipalaeolithic artistic artifacts, we explore wider networks of interaction prior to the Natufian.